Service Manual

Digital Copy

CD 1316

Rev. 1.0
Date: 09-10-2006
2G4SM061

Triumph-Adler

Service Manual

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DC 2316

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CAUTION

DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

ATTENTION

IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT INCORRECT DE LA BATTERIE. REMPLACER UNIQUEMENT AVEC UNE BATTERIE DU MÊME TYPE OU D'UN TYPE RECOMMANDÉ PAR LE CONSTRUCTEUR. METTRE AU RÉBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS DU FABRICANT.

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Safety precautions

This booklet provides safety warnings and precautions for our service personnel to ensure the safety of their customers, their machines as well as themselves during maintenance activities. Service personnel are advised to read this booklet carefully to familiarize themselves with the warnings and precautions described here before engaging in maintenance activities.

Safety warnings and precautions

Various symbols are used to protect our service personnel and customers from physical danger and to prevent damage to their property. These symbols are described below:

⚠**DANGER:** High risk of serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**WARNING:** Serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**CAUTION:** Bodily injury or damage to property may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

Symbols

The triangle (△) symbol indicates a warning including danger and caution. The specific point of attention is shown inside the symbol.

General warning.

Warning of risk of electric shock.

Warning of high temperature.

⃠ indicates a prohibited action. The specific prohibition is shown inside the symbol.

General prohibited action.

Disassembly prohibited.

● indicates that action is required. The specific action required is shown inside the symbol.

General action required.

Remove the power plug from the wall outlet.

Always ground the copier.

1.Installation Precautions

⚠WARNING

- Do not use a power supply with a voltage other than that specified. Avoid multiple connections to one outlet: they may cause fire or electric shock. When using an extension cable, always check that it is adequate for the rated current. .....

- Connect the ground wire to a suitable grounding point. Not grounding the copier may cause fire or electric shock. Connecting the earth wire to an object not approved for the purpose may cause explosion or electric shock. Never connect the ground cable to any of the following: gas pipes, lightning rods, ground cables for telephone lines and water pipes or faucets not approved by the proper authorities. .....

⚠CAUTION:

- Do not place the copier on an infirm or angled surface: the copier may tip over, causing injury. .....

- Do not install the copier in a humid or dusty place. This may cause fire or electric shock. .....

- Do not install the copier near a radiator, heater, other heat source or near flammable material.

  This may cause fire. .....

- Allow sufficient space around the copier to allow the ventilation grills to keep the machine as cool as possible. Insufficient ventilation may cause heat buildup and poor copying performance. .....

- Always handle the machine by the correct locations when moving it. .....

- Always use anti-toppling and locking devices on copiers so equipped. Failure to do this may cause the copier to move unexpectedly or topple, leading to injury. .....

- Avoid inhaling toner or developer excessively. Protect the eyes. If toner or developer is accidentally ingested, drink a lot of water to dilute it in the stomach and obtain medical attention immediately. If it gets into the eyes, rinse immediately with copious amounts of water and obtain medical attention. .....

- Advice customers that they must always follow the safety warnings and precautions in the copier's instruction handbook. .....

2.Precautions for Maintenance

⚠WARNING

- Always remove the power plug from the wall outlet before starting machine disassembly. .....

- Always follow the procedures for maintenance described in the service manual and other related brochures. .....

- Under no circumstances attempt to bypass or disable safety features including safety mechanisms and protective circuits. .....

- Always use parts having the correct specifications. .....
- Always use the thermostat or thermal fuse specified in the service manual or other related brochure when replacing them. Using a piece of wire, for example, could lead to fire or other serious accident. .....

- When the service manual or other serious brochure specifies a distance or gap for installation of a part, always use the correct scale and measure carefully. .....

- Always check that the copier is correctly connected to an outlet with a ground connection. .....
- Check that the power cable covering is free of damage. Check that the power plug is dust-free. If it is dirty, clean it to remove the risk of fire or electric shock. .....

- Never attempt to disassemble the optical unit in machines using lasers. Leaking laser light may damage eyesight. .....

- Handle the charger sections with care. They are charged to high potentials and may cause electric shock if handled improperly. .....

⚠CAUTION

- Wear safe clothing. If wearing loose clothing or accessories such as ties, make sure they are safely secured so they will not be caught in rotating sections. .....

- Use utmost caution when working on a powered machine. Keep away from chains and belts. .....

- Handle the fixing section with care to avoid burns as it can be extremely hot. .....
- Check that the fixing unit thermistor, heat and press rollers are clean. Dirt on them can cause abnormally high temperatures. .....

- Do not remove the ozone filter, if any, from the copier except for routine replacement. .....

- Do not pull on the AC power cord or connector wires on high-voltage components when removing them; always hold the plug itself. .....

- Do not route the power cable where it may be stood on or trapped. If necessary, protect it with a cable cover or other appropriate item. .....

- Treat the ends of the wire carefully when installing a new charger wire to avoid electric leaks. .....

- Remove toner completely from electronic components. .....

- Run wire harnesses carefully so that wires will not be trapped or damaged. .....

- After maintenance, always check that all the parts, screws, connectors and wires that were removed, have been refitted correctly. Special attention should be paid to any forgotten connector, trapped wire and missing screws. .....

- Check that all the caution labels that should be present on the machine according to the instruction handbook are clean and not peeling. Replace with new ones if necessary. .....

- Handle greases and solvents with care by following the instructions below: .....

  Use only a small amount of solvent at a time, being careful not to spill. Wipe spills off completely.
  Ventilate the room well while using grease or solvents.
  Allow applied solvents to evaporate completely before refitting the covers or turning the power switch on.
  Always wash hands afterwards.

- Never dispose of toner or toner bottles in fire. Toner may cause sparks when exposed directly to fire in a furnace, etc. .....

- Should smoke be seen coming from the copier, remove the power plug from the wall outlet immediately. .....

3.Miscellaneous

⚠WARNING

- Never attempt to heat the drum or expose it to any organic solvents such as alcohol, other than the specified refiner; it may generate toxic gas. .....

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Setup guide
Print server

1-1-1 Specifications

Main body

Printing system	Electro-photographic
Originals	Sheets of paper, books and 3-dimensional objects
Copy sizes	Paper cassette: A4, B5 (JIS), A5, folio, legal, letter, oficio II Manual feed tray: A4, B5 (JIS), A5, folio, legal, letter, oficio II, statement, executive, A6, B6, B5 (ISO), envelope #10, envelope #9, envelope monarch, envelope #6, envelope C5, envelope DL, 16K
Paper types	Paper cassette: Plain paper, recycled paper, thick paper 60 to 105 g/m^2 Manual feed tray: Plain paper, recycled paper, thick paper 60 to 163 g/m^2 Transparency, envelopes and post cards supported
Paper feed source capacity	Paper cassette: 250 sheets Manual feed tray: 1 sheet
Output tray capacity	100 sheets (face-down)
Photoconductor	OPC drum (diameter 30 mm/1 3/16")
Charging system	Scorotron (positive charging)
Developing system	Mono component dry developing method Toner replenishing: Automatic from the toner container
Transfer system	Transfer roller (negative-charged)
Separation system	Small diameter separation
Fusing system	Heat roller system
Charge erasing system	Exposure by eraser lamp (LED)
Cleaning system	Drum: Counter blade
Warm-up time	25 seconds or less
Memory	32 MB
Ambient conditions	Temperature: 10 to 32.5 °C/50 to 95 °F Humidity: 20 to 80 %RH Altitude: Maximum 2,000 m/6,562 ft Illumination: 1,500 lux or less
Power source	120 V AC, 60 Hz, 8.2 A 220 to 240 V AC, 50 Hz, 3.9 A
Dimensions (W) × (D) × (H)	476 × 392 × 489 mm/18 3/4" × 15 7/16" × 19 1/4"
Weight	Approx. 15 kg/33 lbs
Required space (W) × (D)	479 × 437 mm/18 7/8" × 17 3/16"
Option	Print server

Copying functions

Copying speed	Platen (1:1) A4: 16 copies/min. A5: 10 copies/min. B5: 14 copies/min. Letter: 17 copies/min. Document processor (1:1) A4: 12 copies/min. A5: 10 copies/min. B5: 14 copies/min. Letter: 13 copies/min. Legal: 11 copies/min.
First copy (1:1, Letter/A4)	Platen 12±0.5 seconds Document processor 14±0.5 seconds
Resolution	Scanning and printing: 600 × 600 dpi
Continuous copying	1 to 99 sheets
Zoom ratios	Any 1 % increment between 25 and 400 %

Printing functions

Printing speed	A4: 16 pages per minute/Letter: 17 pages per minute
First print	11 seconds or less
Resolution	600 × 600 dpi
Host Interface	USB: 1 port (Hi-speed USB)

Scanning functions

Scanning Speed	Monochrome: 5 scan/min. Full color or grayscale: 5 scan/min. (TWAIN) 4 scan/min. (QLINIK) 1:1, Letter/A4, 300 dpi
Resolution	600 × 300 dpi
Color mode	Full color: 24 bit/dot (each color) Grayscale: 8 bit/dot Monochrome: 1 bit/dot
File format	PDF, TIFF, JPEG (8-Bit gray mode, 24-Bit color mode), BMP
Host Interface	USB (TWAIN): 1 port (Hi-speed USB)

Document processor (DP)

Original feed system	Automatic feeding
Originals	Sheets of paper
Original size	Maximum: Legal Minimum: Statement and A5R
Original paper weight	60 to 105 g/m^2
Maximum number of originals	50 sheets

Environmental specifications

Duplex copying	Manual
Paper feed	Recycled paper made from 100% recycled pulp may be used with this product.

NOTE: These specifications are subject to change without notice.

1-1-2 Parts names

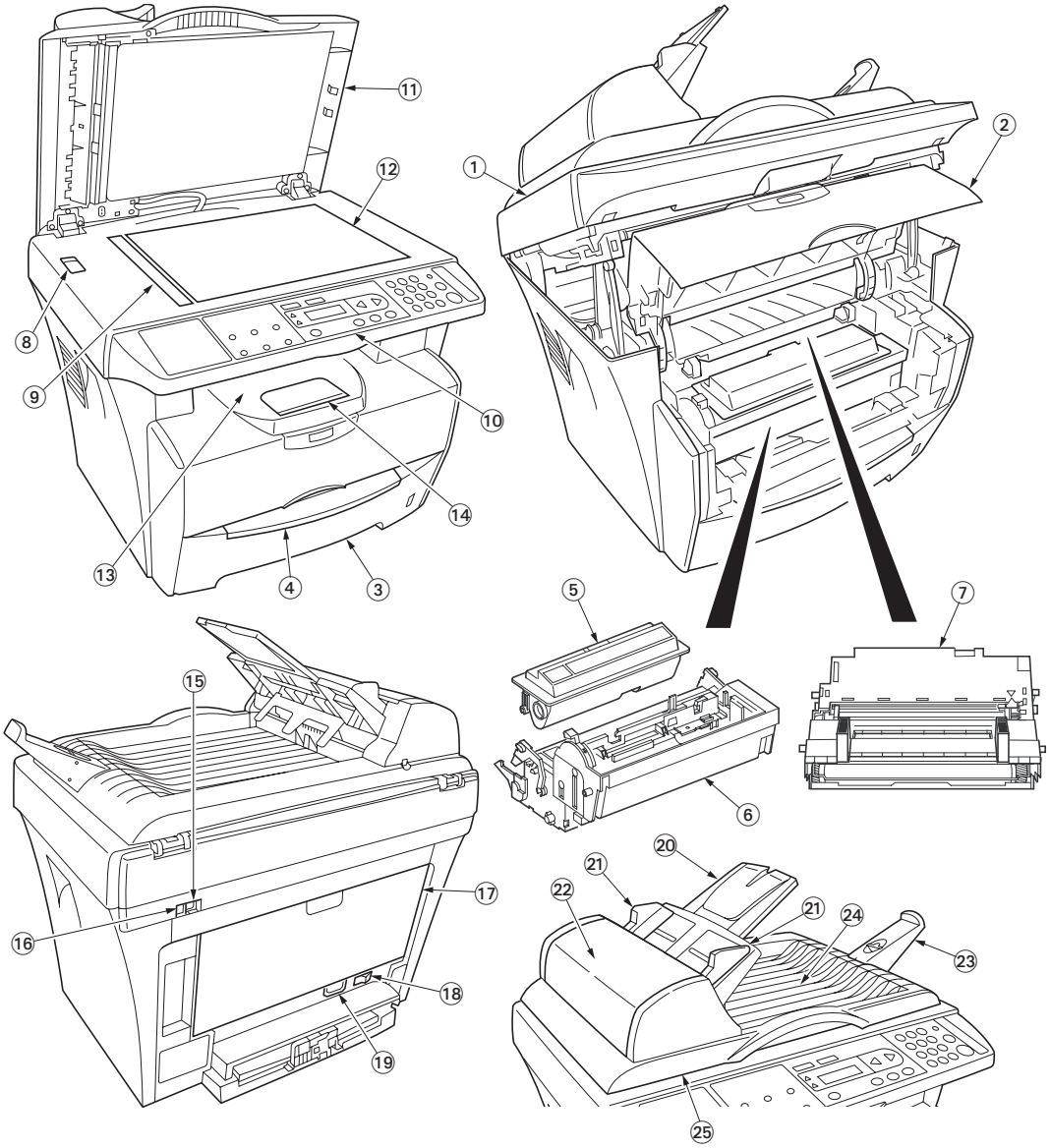

Figure 1-1-1

1. Scanner unit
2. Front cover
3. Paper cassette
4. Manual feed tray
5. Toner container
6. Developer unit
7. Drum unit
8. Shipping lock
9. Original size indicator plate
10. Operation panel
11. Original cover
12. Platen
13. Output tray
14. Paper stopper
15. USB Interface connector
16. 5 V DC output (for print server)
17. Rear cover
18. Power switch
19. AC inlet
20. Original table
21. Original insert guides
22. Left cover
23. Ejection extension
24. Original eject table
25. Document processor (DP)

(1) Operation panel

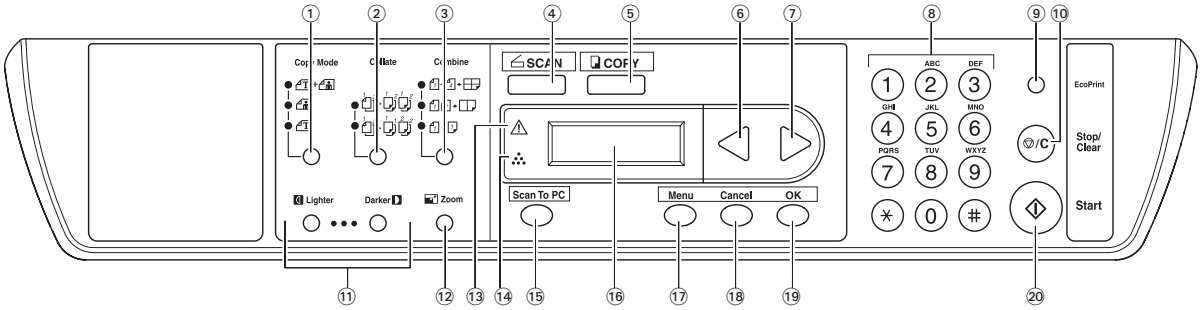

Figure 1-1-2

1. Copy mode key and indicator
2. Collate key and indicator
3. Combine key and indicator
4. SCAN key
5. COPY key and indicator
6. ◀ key
7. ▶ key
8. Numeric keys
9. EcoPrint key and indicator
10. Stop/Clear key
11. Exposure adjustment key/Exposure display
12. Zoom key
13. Memory overflow indicator
14. Toner indicator
15. Scan To PC key
16. Message display
17. Menu key
18. Cancel key
19. OK key
20. Start key

1-1-3 Machine cross section

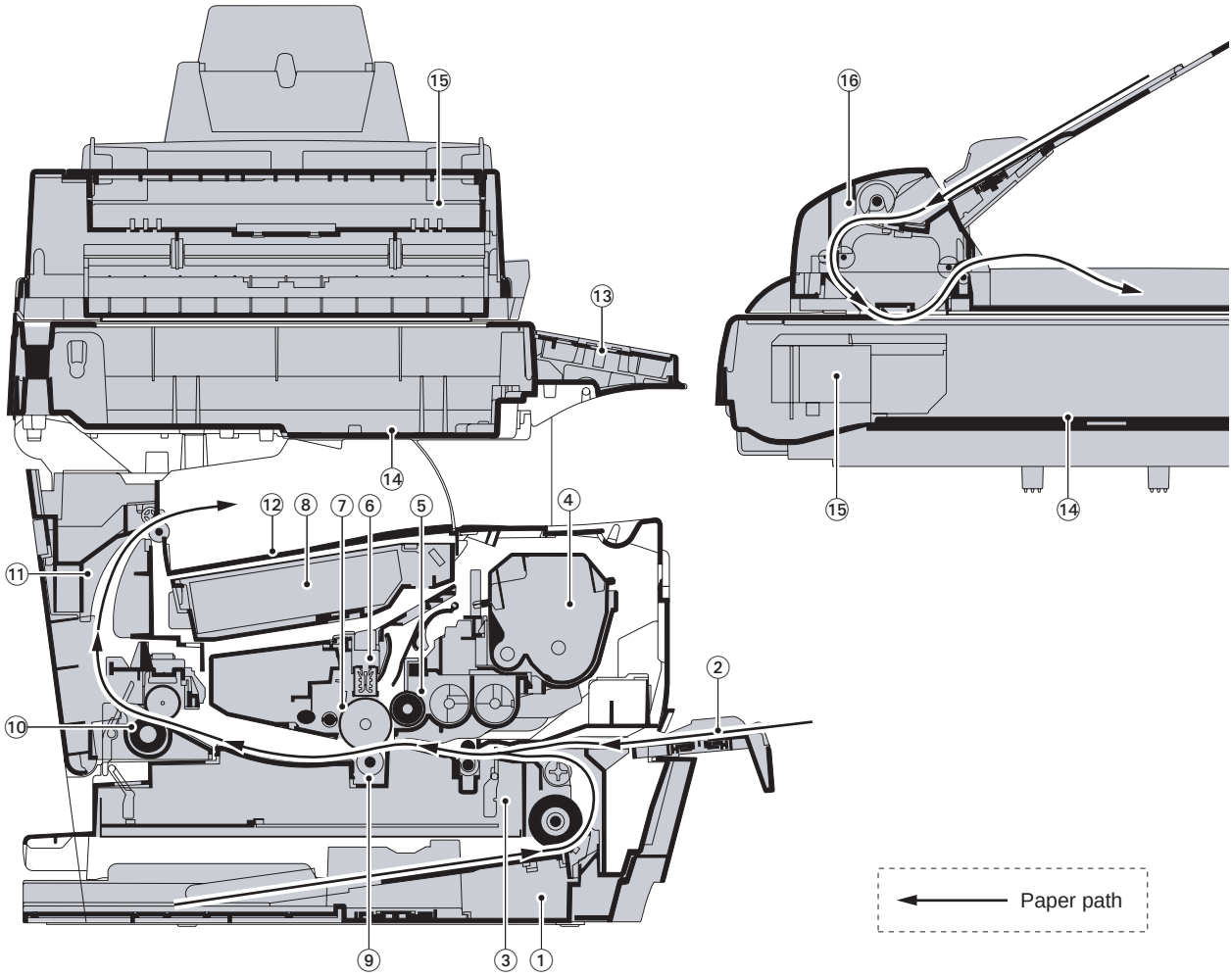

Figure 1-1-3 Machine cross section

1. Paper cassette
2. Manual feed tray
3. Paper feeding/conveying section
4. Toner container
5. Developer unit
6. Main charger unit
7. Drum unit
8. Laser scanner unit
9. Transfer section
10. Fuser unit
11. Paper exit section
12. Output tray
13. Operation unit
14. Scanner unit
15. Optical module unit
16. Document processor (DP)

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1-2-1 Installation environment

1. Temperature: 10 to 32.5°C/50 to 90.5°F
2. Humidity: 15 - 80%RH
3. Power supply: 120 V AC, 9.0 A
   220 - 240 V AC, 5.0 A (Average)
4. Power source frequency: 50 Hz ±0.3%/60 Hz ±0.3%
5. Installation location
   Avoid direct sunlight or bright lighting. Ensure that the photoconductor will not be exposed to direct sunlight or other strong light when removing paper jams.
   Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.
   Avoid dust and vibration.
   Choose a surface capable of supporting the weight of the machine.
   Place the machine on a level surface (maximum allowance inclination: 1°).
   Avoid air-borne substances that may adversely affect the machine or degrade the photoconductor, such as mercury, acidic of alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.
   Select a room with good ventilation.
6. Allow sufficient access for proper operation and maintenance of the machine.
   Machine front: 100 cm/39 3/8"
   Machine rear: 25 cm/9 13/16"
   Machine right: 30 cm/11 13/16"
   Machine left: 30 cm/11 13/16"

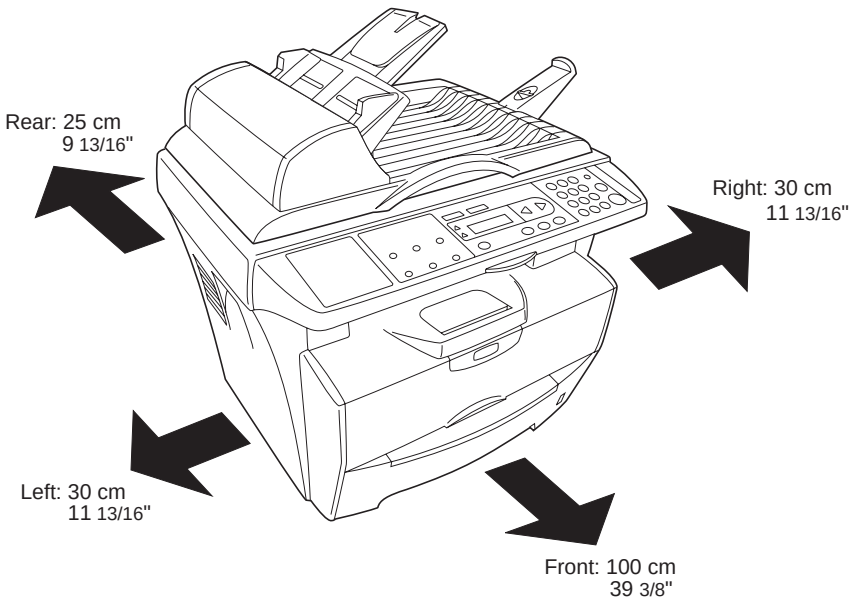


Figure 1-2-1

1-2-2 Unpacking and installation

(1) Installation procedure

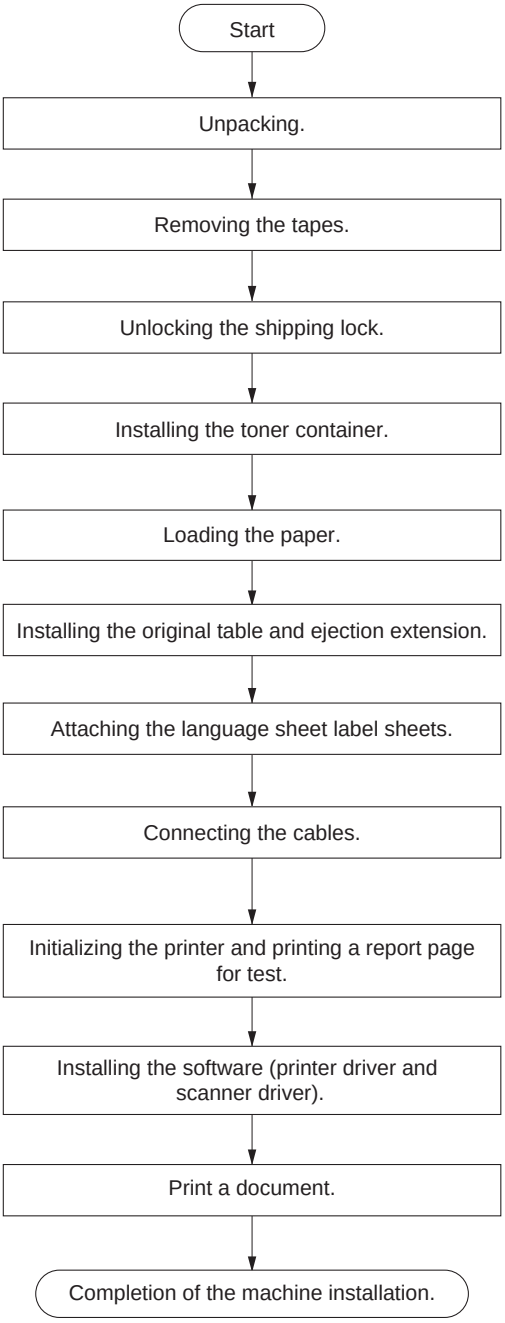

Start
Unpacking.
Removing the tapes.
Unlocking the shipping lock.
Installing the toner container.
Loading the paper.
Installing the original table and ejection extension.
Attaching the language sheet label sheets.
Connecting the cables.
Initializing the printer and printing a report page for test.
Installing the software (printer driver and scanner driver).
Print a document.
Completion of the machine installation.

Figure 1-2-2

Unpacking.

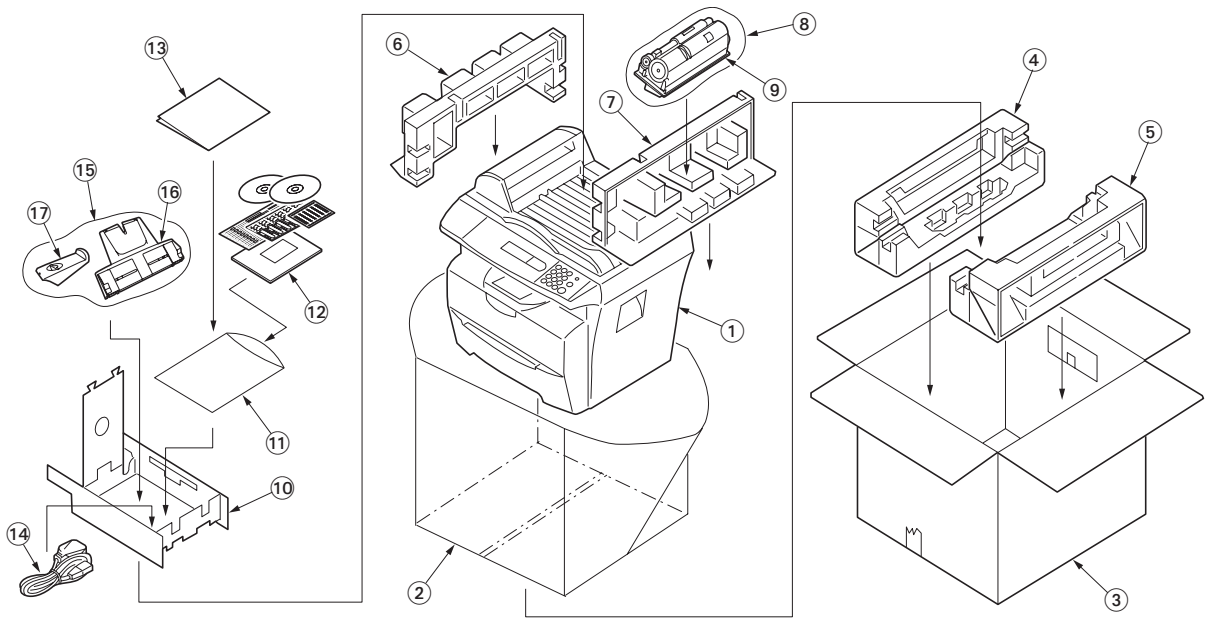


Figure 1-2-3 Unpacking

1. Machine (main body)
2. Machine cover
3. Outer carton
4. Bottom pad L
5. Bottom pad R
6. Top pad L
7. Top pad R
8. Plastic bag
9. Toner container
10. Pad tray
11. Plastic bag
12. Operation guide, CD-ROM(s), Language label sheet and etc.
13. Installation guide
14. Power cord
15. Plastic bag
16. Original table
17. Ejection extension

Removing the tapes.

1. Remove the four tapes.

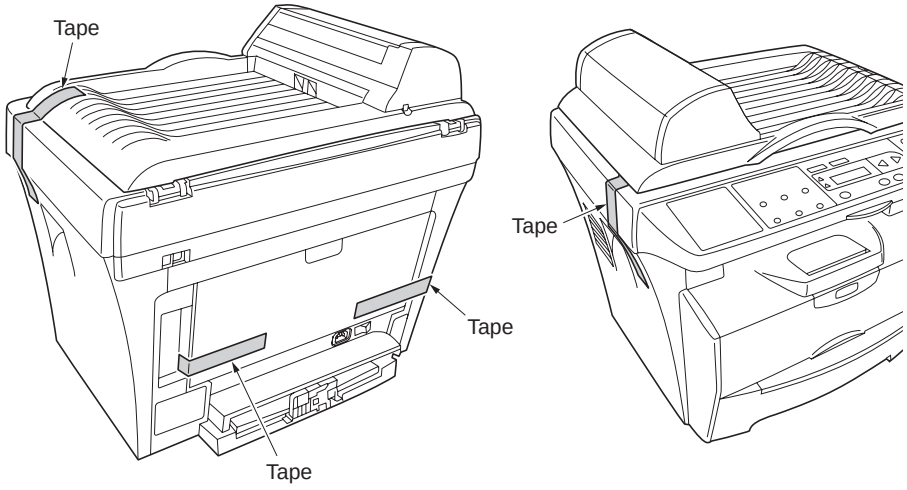


Figure 1-2-4

Unlocking the shipping lock.

1. Open the document processor (DP).
2. Unlock the shipping lock.
3. Close the document processor (DP).

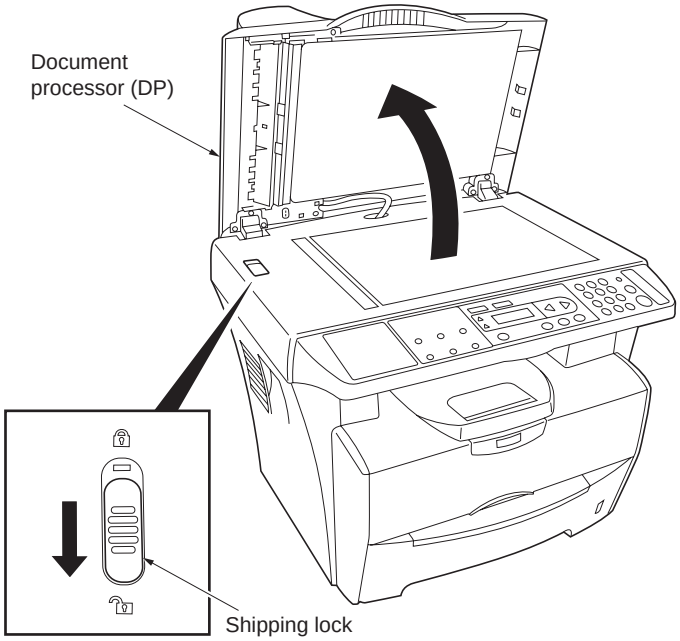


Figure 1-2-5

Installing the toner container.

1. Open the scanner unit.
2. Open the front cover.

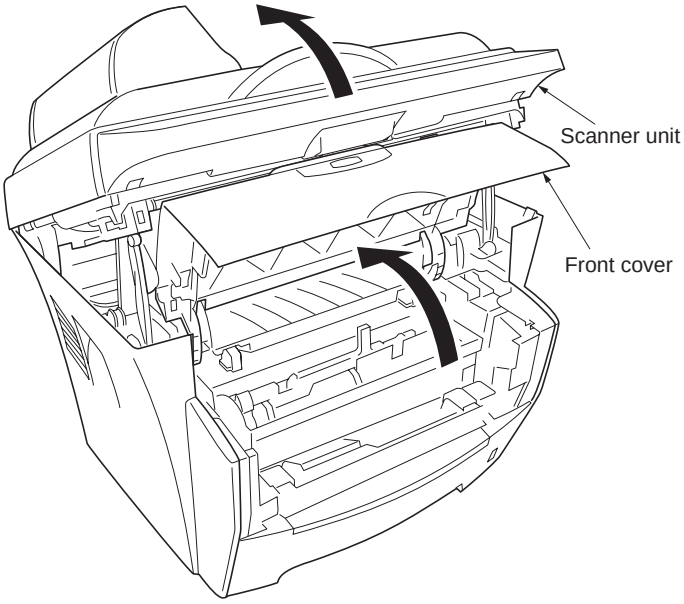


Figure 1-2-6

3. Shake the container horizontally to distribute the toner evenly.
4. Remove the seal from the toner container.

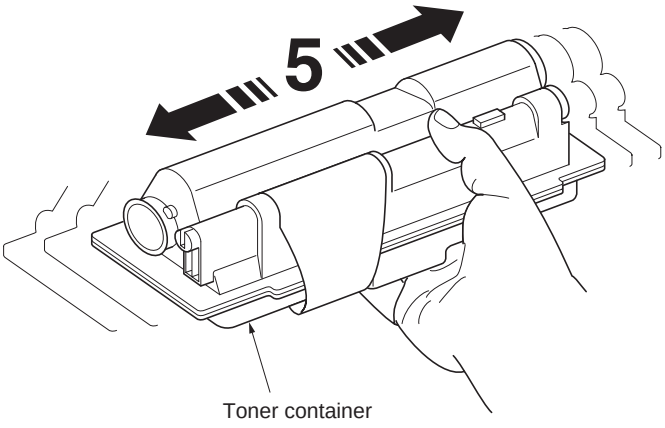


Figure 1-2-7

5. Remove the seal from the toner container.

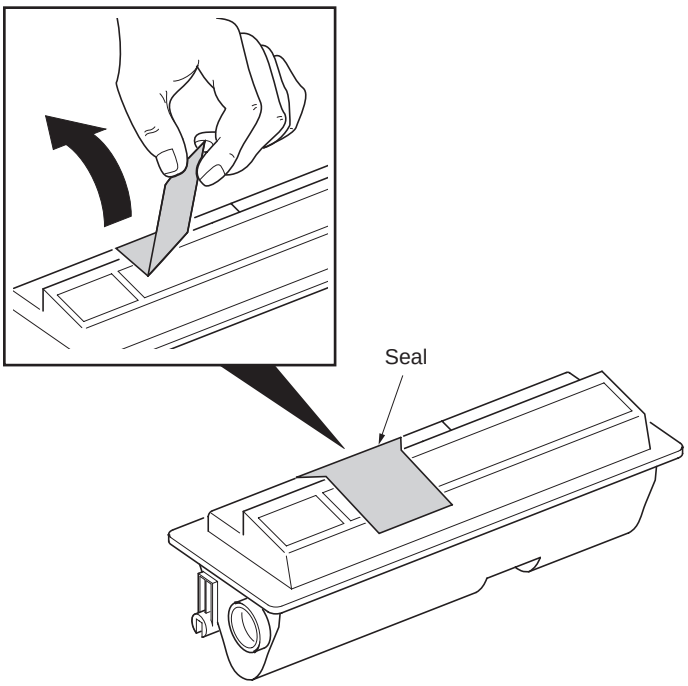


Figure 1-2-8

6. Turn the toner container release lever to the [UNLOCK] position.
7. Install the toner container in the printer.

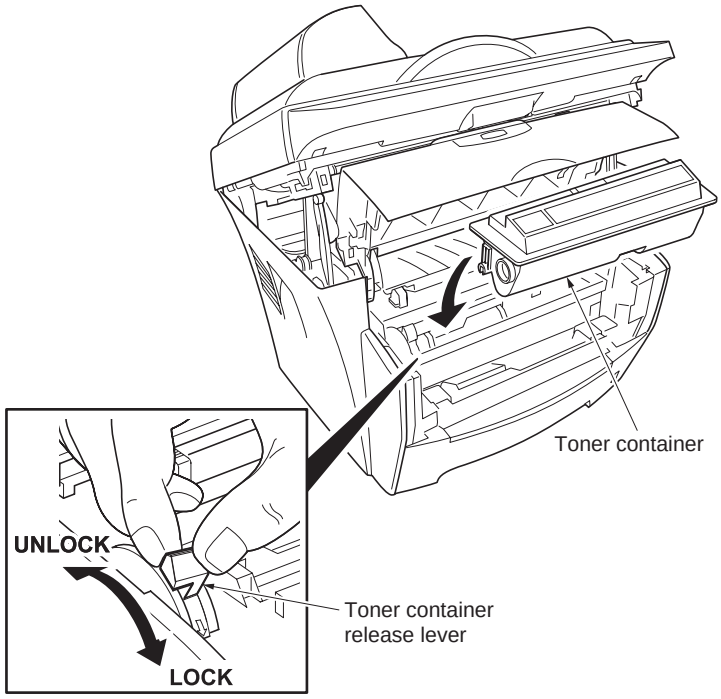


Figure 1-2-9

8. Push firmly on the top of the container at the positions marked [PUSH HERE] until you hear a click.
9. Turn the toner container release lever to the [LOCK] position.
10. Close the front cover.
11. Close the scanner unit.

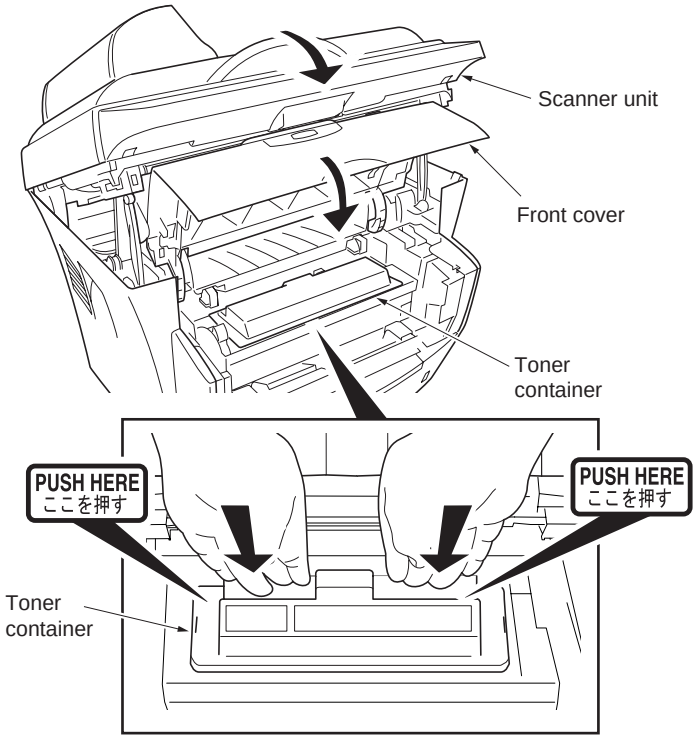


Figure 1-2-10

Loading the paper.

1. Pull the paper cassette completely out of the machine.
2. Press the release button and adjust the paper length guide to the paper size required.
3. Adjust the position of the width guides located on the left and right sides of the paper cassette. Press the release button on the left guide and slide the guides to the paper size required.
4. Load the paper in the paper cassette.
5. Push the paper cassette back into the machine until it stops.

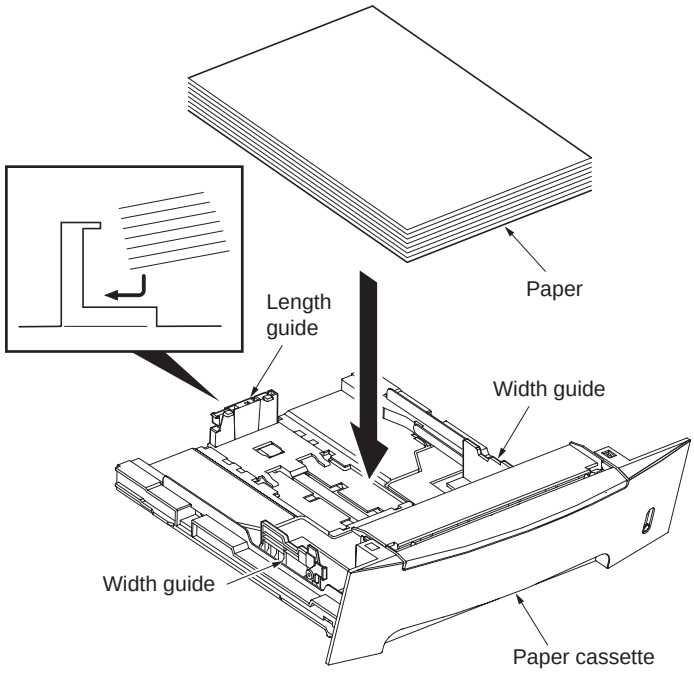


Figure 1-2-11

Installing the original table and ejection extension.

1. Install the original table.
2. Install the ejection extension.

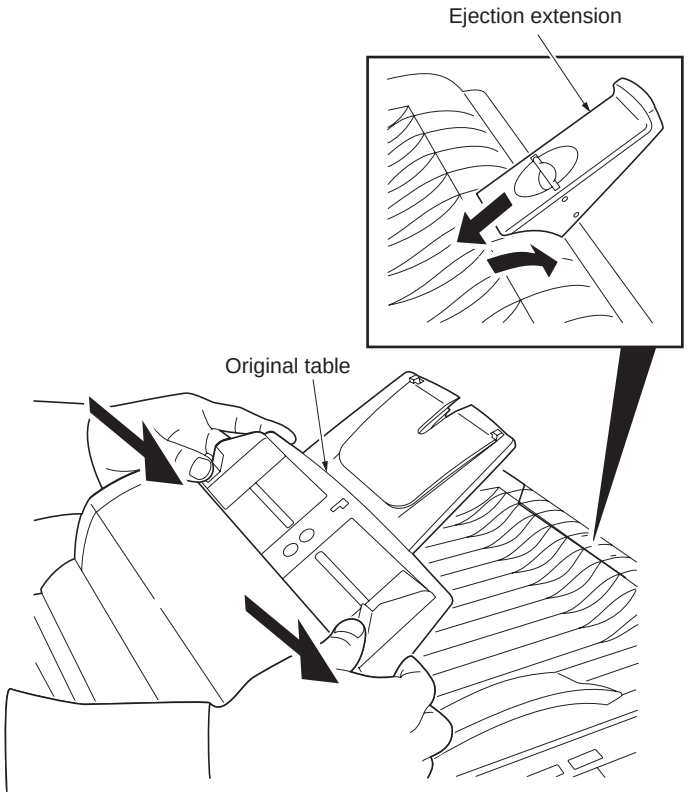


Figure 1-2-12

Attaching the language label sheets.

1. Remove the language label sheet.
2. Attach the language label sheet on the operation panel.

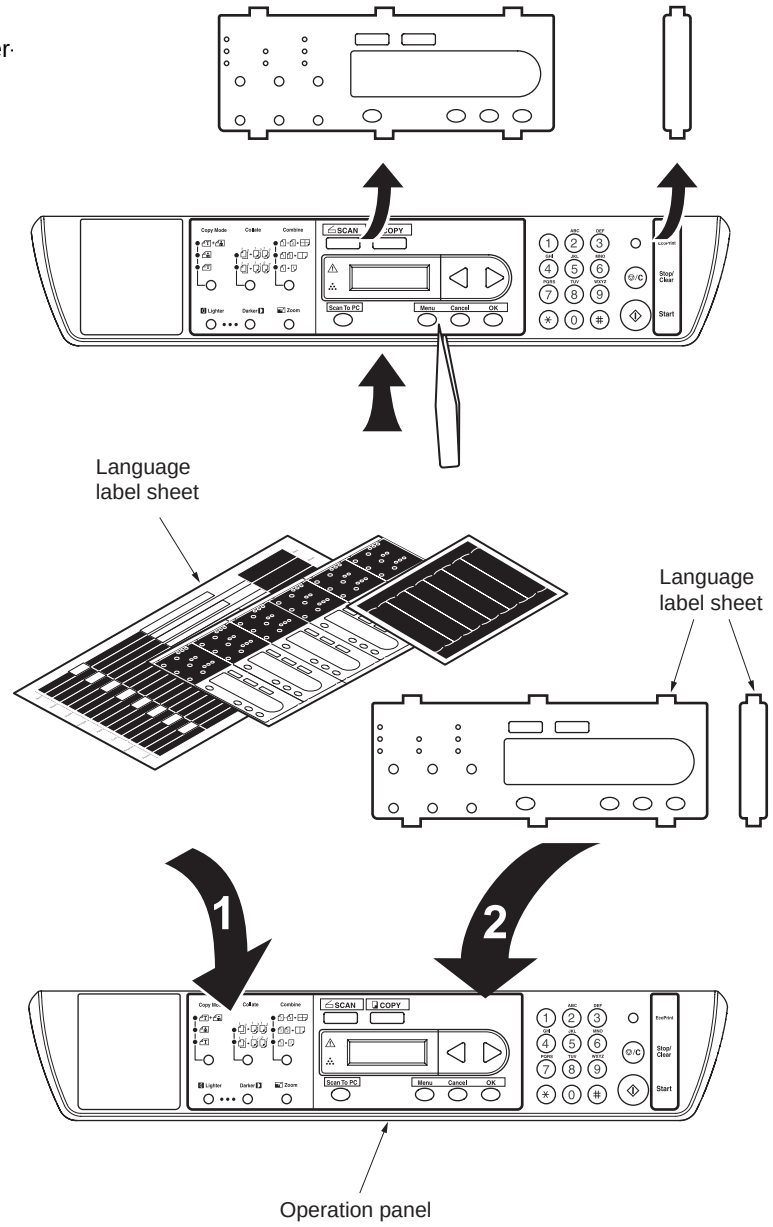


Figure 1-2-13

Connecting the cables.

1. Connect the printer cable to the USB interface connector.
2. Connect the other end of the printer cable to the PC's USB interface connector.
3. Connect the power cord to the printer AC inlet.
4. Connect the power cord to the wall outlet.

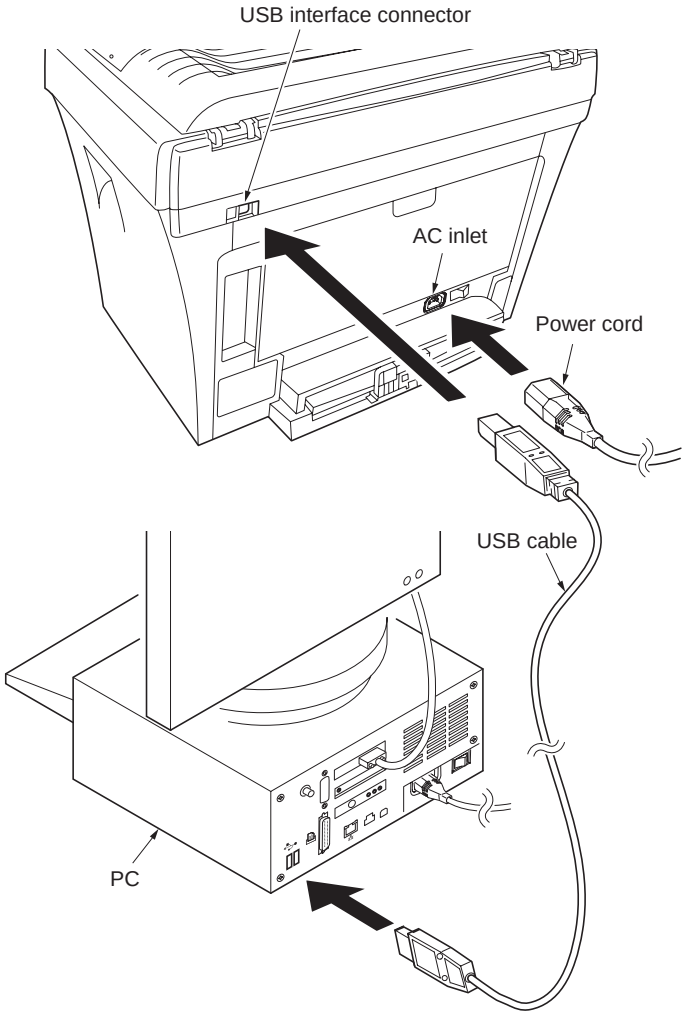


Figure 1-2-14

Initializing the printer and printing a report page for test.

1. Turn the power switch on. The machine will begin to warm up after which the basic screen is displayed.
2. Press the Menu key.
3. Press the ◀ or ▶ key to select [3. Report.]
4. Press the OK key.
5. Press the ◀ or ▶ key to select [31. Configuration], [32. Menu Map] or [33. Usage report].
6. Press the OK key.
   Printing of the report will begin.
   The display returns to the [3. Report] screen.

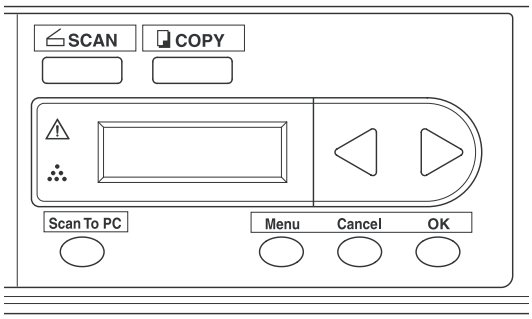


Figure 1-2-15

Installing the software (printer driver and scanner driver).

Ensure the machine is plugged in and connected to the PC's USB port before installing software from the CD-ROM.
Required operating systems (OS) for using the Software: Microsoft Windows 98SE/Me/2000/XP

1. Switch on the PC and activate Windows.
   NOTE: If the Welcome to the Found New Hardware Wizard dialog box displays, select Cancel.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Figure 1-2-16

2. Insert the CD-ROM (Product Library) into the CD-ROM drive. Once the installation program launches, the License Agreement Notice is displayed.
   NOTE: If the installation program fails to launch, use Windows Explorer to access the CD-ROM and double-click Setup.exe.
3. Click View License Agreement to display and read it.
4. Click Accept to proceed.

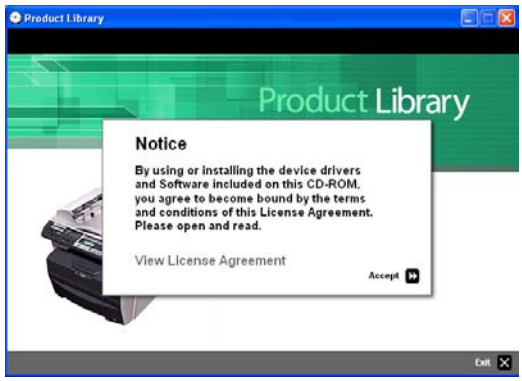

Product Library
Product Library
Notice
By using or installing the device drivers and Software included on this CD-ROM, you agree to become bound by the terms and conditions of this License Agreement. Please open and read.
View License Agreement
Accept
Exit

Figure 1-2-17

5. Click Select Language.

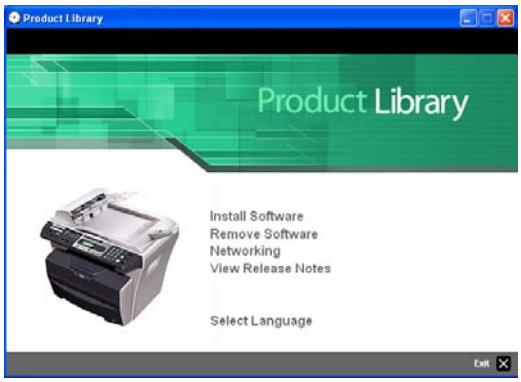


Figure 1-2-18

6. Click the language to be used.
7. Click Install Software. The Installation Wizard starts.
8. Click Next.

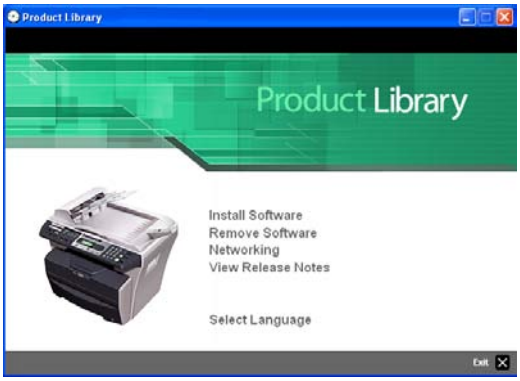


Figure 1-2-19

9. For the simple, default installation, select Express Mode and click Next.
   Note: If you selected Custom Mode, select Universal Serial Bus (USB) to select the connection method, and follow the on-screen instructions.

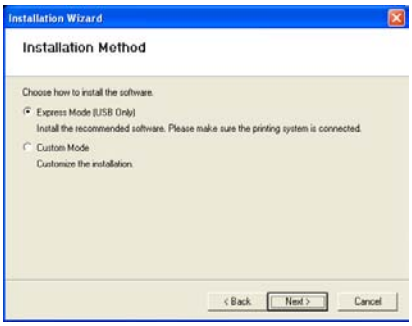

Installation Wizard
Installation Method
Choose how to install the software.
Express Mode (USB Only)
Install the recommended software. Please make sure the printing system is connected.
Custom Mode
Customize the installation.
< Back
Next >
Cancel

Figure 1-2-20

10. Click Install. The installation program installs the software.

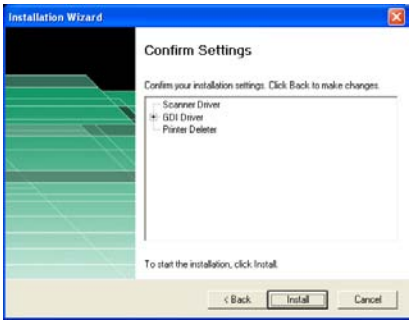


Figure 1-2-21

Note: When installing software for Windows XP, if a software installation warning for an unsigned device driver is displayed, click Continue Anyway to bypass the warning and install the driver. All device drivers have been fully tested.

Hardware Installation
The software you are installing for this hardware:
Printers
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Figure 1-2-22

11. When the installation is complete, the Installation Completed Successfully window is displayed. Click Finish to leave the install program and return to the disc main menu.

Print a document.

1. From the application File menu, select Print. The Print dialog box displays.
2. Select the drop down list of printer names.
3. Select the options required, enter the number of copies required and if printing more than one set, select Collate. Select OK to start printing.

Completion of the machine installation.

1-3-1 Service mode

(1) Printing the system configuration page

Description
Lists information on the settings and environments of use for this machine.

Purpose
To acquire the current printing environmental parameters and cumulative information.

Procedure
1. Press the Menu key.
2. Press the ◀ or ▶ key to select [3. Report.]
3. Press the OK key.
4. Press the ◀ or ▶ key to select [31. Configuration].
5. Press the OK key.
   Printing of the system configuration page will begin.
   The display returns to the [3. Report] screen.

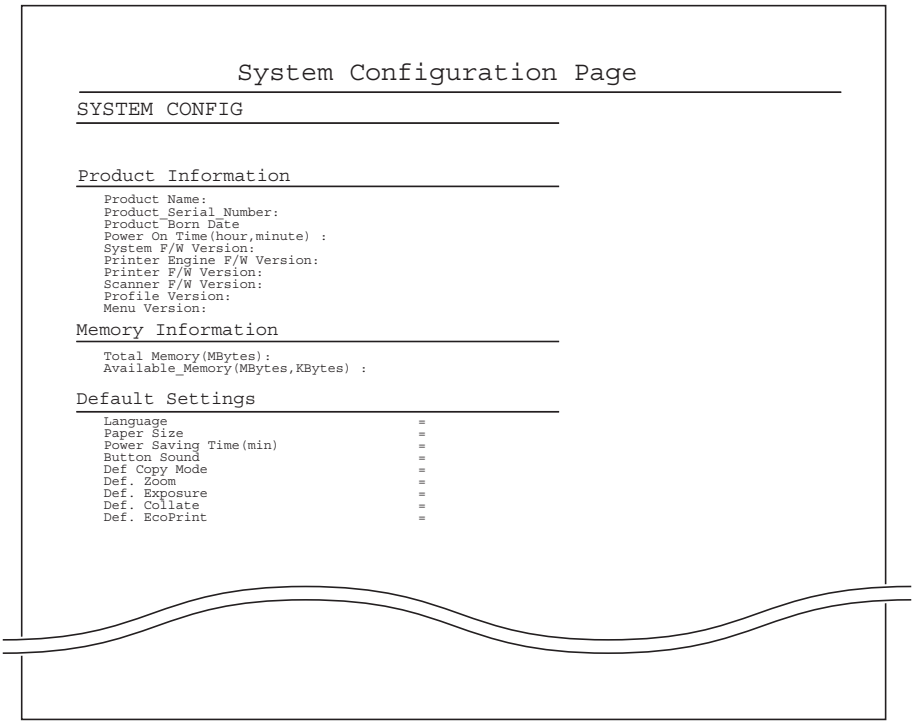


Figure 1-3-1 System configuration page

1-3-2 System Settings

The machine is equipped with a system settings which can be operated by users (mainly by the machine administrator). In this machine system settings, default settings can be changed.

Procedure

1. Press the Menu key.
2. Press the ◀ or ▶ key to select [1.Common Setup].
3. Press the OK key.
4. Select the system settings below.

Message Language

Select the language of the message display.

1. Press the ◀ or ▶ key to select the language to be used in the display and press the OK key.
   The display changes to the selected language and returns to the ready screen.

Sleep Mode

Conserve power when it is not operating.

1. Press the ◀ or ▶ key to select [13. Sleep Mode].
2. Press the ◀ or ▶ key to select the time for the Sleep Mode to engage and press the OK key.
   Initial setting: 15 min.
   The display returns to the ready screen.

Toner Install

Resets the toner counter after replacing the toner container.

1. Press the ◀ or ▶ key to select [14. Toner Install].
2. Press the ◀ or ▶ to select [On] and press the OK key.
   The display returns to the ready screen.

Buzzer

The Buzzer can be set to sound when a key on the operation panel is pressed or in cases when errors occur, etc.

1. Press the ◀ or ▶ key to select [16. Buzzer].
2. Press the ◀ or ▶ to select [On] or [Off]. Press the OK key. The display returns to the ready screen.

Drum Reset

Perform the drum reset procedure when the drum unit has been replaced.

1. Press the ◀ or ▶ key to select [17. Drum Reset].
2. Press the ◀ or ▶ to select [On] and press the OK key. The display returns to the ready screen.

Drum Refresh

The drum refresh is cleaning the drum surface. If potential printing quality problems has occurred, perform the drum refresh.

1. Press the ◀ or ▶ key to select [18. DrumRefresh].
2. Press the ◀ or ▶ to select [On] or [Off]. Press the OK key. The display returns to the ready screen.

Drum Control

The drum control is cleaning the drum surface automatically when the machine is turned on.

1. Press the ◀ or ▶ key to select [19. DrumControl].
2. Press the ◀ or ▶ to select the cleaning time.
   Setting range: 0/90/155
   Press the OK key. The display returns to the ready screen.

Eco Fuser

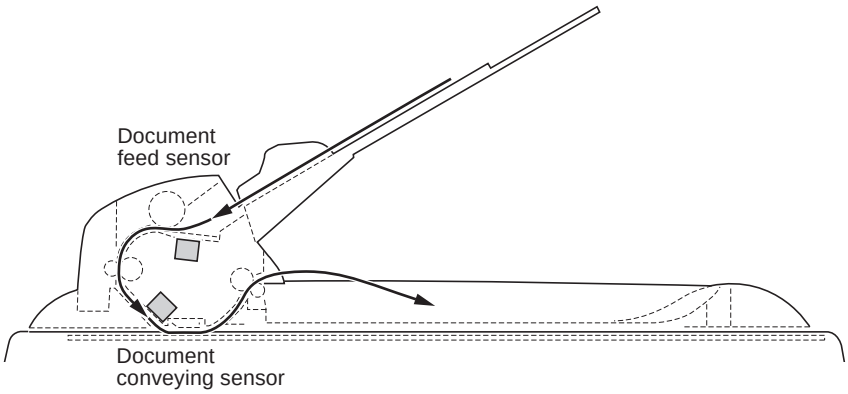
When this mode is selected On, the fuser heater is switched off during sleep mode to save power consumption. However, warm-up time becomes longer than Off.

1. Press the ◀ or ▶ key to select [110. Eco Fuser].
2. Press the ◀ or ▶ to select [On] or [Off]. Press the OK key. The display returns to the ready screen.

1-4-1 Paper misfeed detection

(1) Paper misfeed indication

When a paper misfeed occurs, the printer immediately stops printing and displays the paper misfeed message on the operation panel. To remove paper misfed in the machine, open the front cover or the rear cover or pull out the paper cassette.To remove original jammed in the DP, open the original cover.



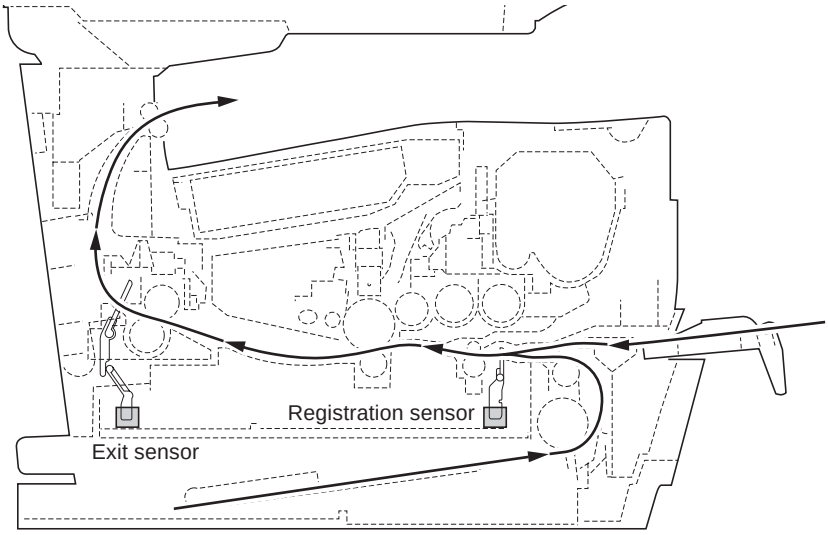


Figure 1-4-1Paper misfeed detection

1-4-2 Self-diagnosis

(1) Self-diagnostic function

This machine is equipped with a self-diagnostic function. When a problem is detected, the machine stops printing and an error message is displayed on the operation panel.

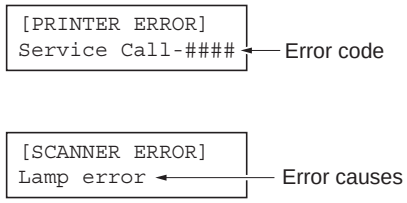


Figure 1-4-2Error message display

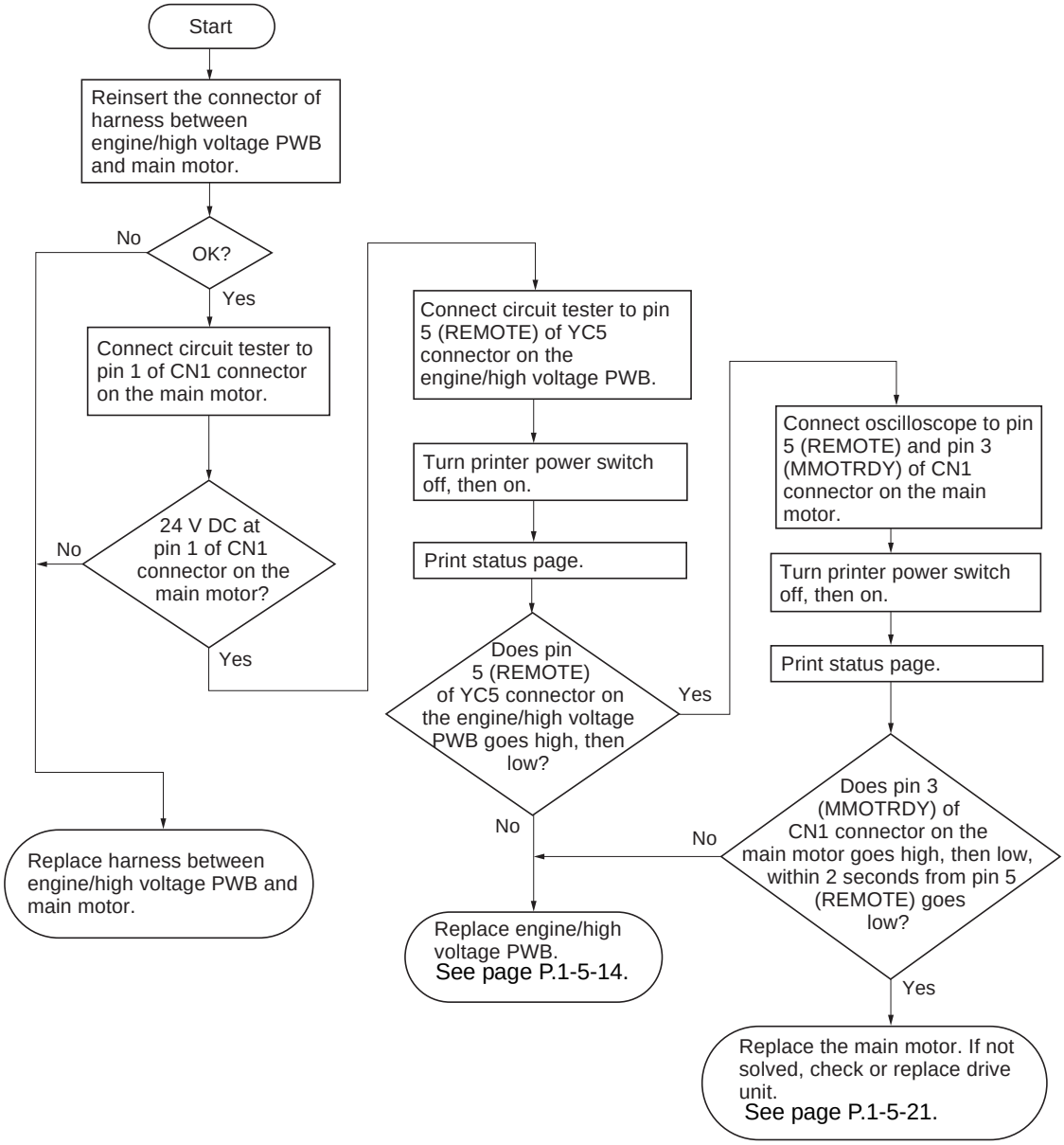
(2) Service error message

Service error message	Contents	Remarks	
		Causes	Check procedures/corrective measures
[PRINTER ERROR] Service Call-####	"####" means self-diagnostic error code.	Self-diagnostic error occurred.	Turn the power switch off and then back on again. If this message still remains, follow the self-diagnostic error code instruction. See page P.1-4-2.
[PRINTER ERROR] Out of Memory	On-line printer jobs are crowded.	The data transferred to the machine was too complex to print on a page.	Wait a while, and check again.
		Memory error.	Turn the power switch off and then back on again. If this message still remains, replace the main PWB (See page P.1-5-29).
[PRINTER ERROR] Engine Panic	The engine/high voltage PWB can not establish communication between engine/ high voltage PWB and the main PWB over 10 s.	Defective PWB.	Replace the main PWB or engine/high voltage PWB (See page P.1-5-29 or P.1-5-14).
[SCANNER ERROR] Lamp Error	Exposure lamp error for scanner.	Poor contact in exposure lamp connector terminals.	Reinsert the connector (See page P.1-5-31).
		Defective exposure lamp.	Replace the exposure lamp (See page P.1-5-31).
		Defective inverter PWB.	Replace the optical module unit (See page P.1-5-24).
		Defective FFC between main PWB and CCD PWB, or improper connector insertion.	Reinsert the FFC. Also check for continuity within the FFC. If none, remedy or replace the FFC (See page P.1-5-29, P.1-5-28).
		Defective optical module unit.	Replace the optical module unit (See page P.1-5-24).
		Defective main PWB.	Turn the power switch off and then back on again. If this message still remains, replace the main PWB (See page P.1-5-29).
[SCANNER ERROR] AFE R/W Error	AFE read/write error for scanner.	Defective main PWB.	Turn the power switch off and then back on again. If this message still remains, replace the main PWB (See P.1-5-29).
[SCANNER ERROR] Home sensor	Scanner home position sensor error for scanner.	Shipping lock is locked.	Turn the power switch off and slide shipping lock to unlock position (See page P.1-2-4).
		Poor contact in scanner home position connector terminals.	Reinsert the connector (See page P.1-5-35).
		Defective FFC between main PWB and CCD PWB, or improper connector insertion.	Reinsert the FFC. Also check for continuity within the FFC. If none, remedy or replace the FFC (See page P.1-5-29, P.1-5-28).

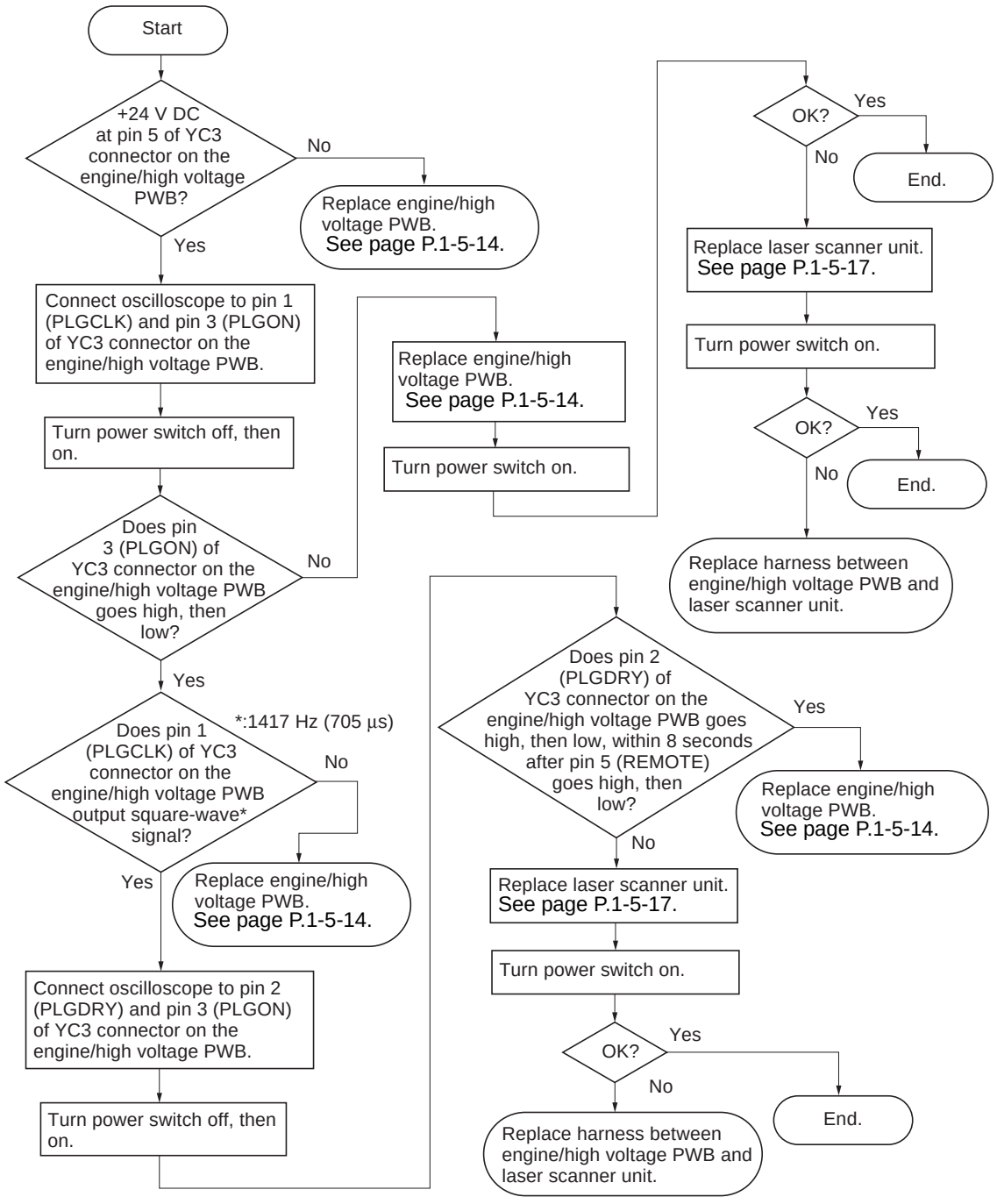
Service error message	Contents	Remarks	
		Causes	Check procedures/corrective measures
[SCANNER ERROR] Home sensor	Scanner home position sensor error for scanner.	Defective scanner home position sensor.	Replace the scanner home position sensor (See page P.1-5-35).
		Defective main PWB.	Turn the power switch off and then back on again. If this message still remains, replace the main PWB (See page P.1-5-29).
[SCANNER ERROR] Motor Stall	Scanner motor stall for scanner.	Defective scanner belt spring.	Replace the scanner belt spring.
		Poor contact in scanner motor connector terminals.	Reinsert the connector (See page P.1-5-36).
		Defective FFC between main PWB and CCD PWB, or improper connector insertion.	Reinsert the FFC. Also check for continuity within the FFC. If none, remedy or replace the FFC (See page P.1-5-29, P.1-5-28).
		Defective scanner motor.	Replace the scanner motor (See page P.1-5-36).
		Defective main PWB.	Turn the power switch off and then back on again. If this message still remains, replace the main PWB (See page P.1-5-29).
		Defective scanner unit.	Replace the scanner unit (See page P.1-5-22)
Toner Low	Toner low for machine.	Toner is running low.	Replace the toner container.
		Defective toner container.	Replace the toner container.
		Defective main PWB.	Replace the main PWB (See page P.1-5-29).
Please Replace Toner	Toner empty for machine.	Toner has run out so further copying or printing is impossible.	Replace the toner container.
		Defective toner container.	Replace the toner container.
		Defective main PWB.	Replace the main PWB (See page P.1-5-29).

(3) Service call codes

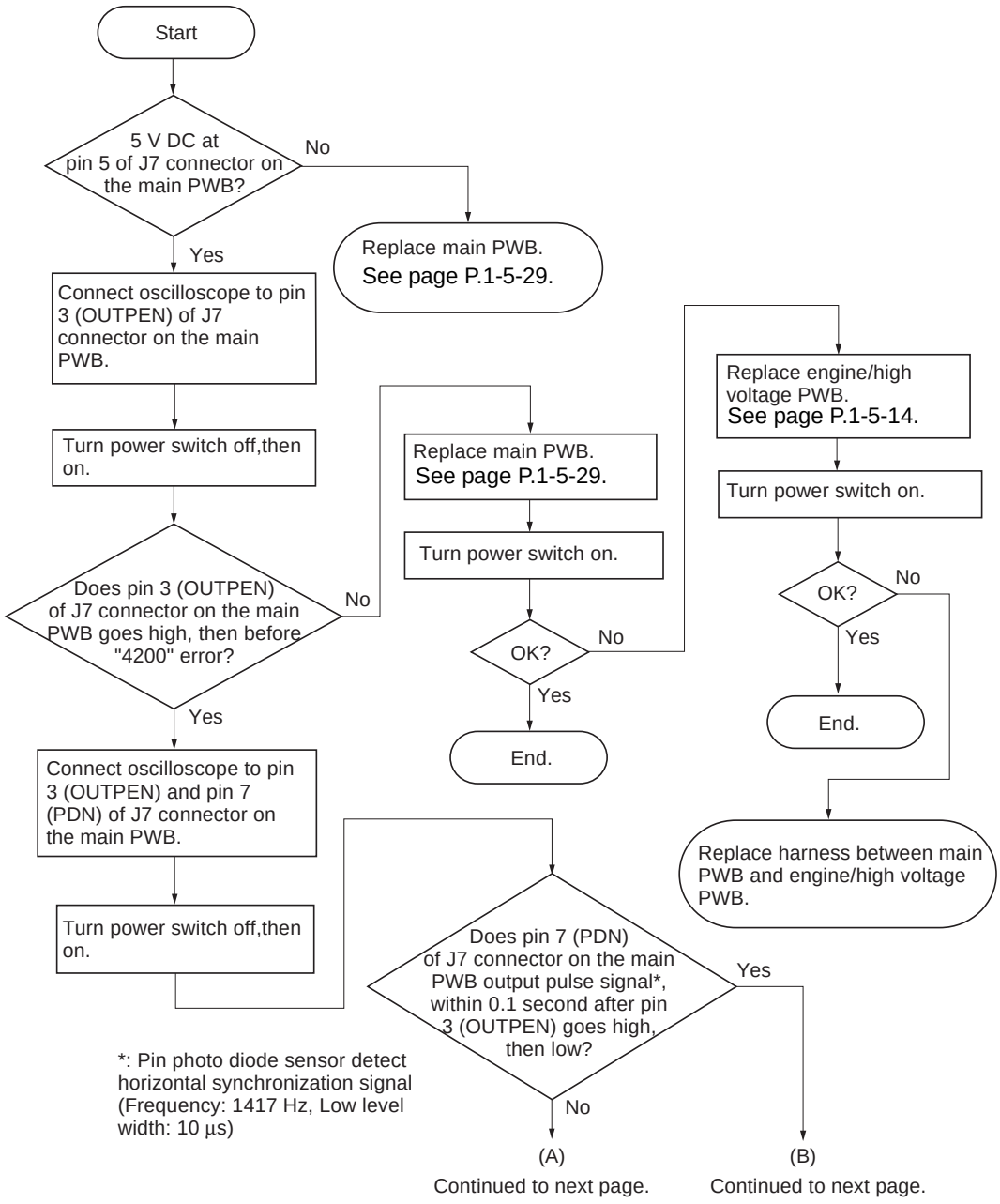
Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
2000	**Main motor error** The main motor ready input is not given for two seconds during the main motor is driven.	Defective harness between engine/ high voltage PWB and main motor.	Follow the flow chart.
		Defective main motor.	
		Defective engine/ high voltage PWB.	
		Defective drive unit.	

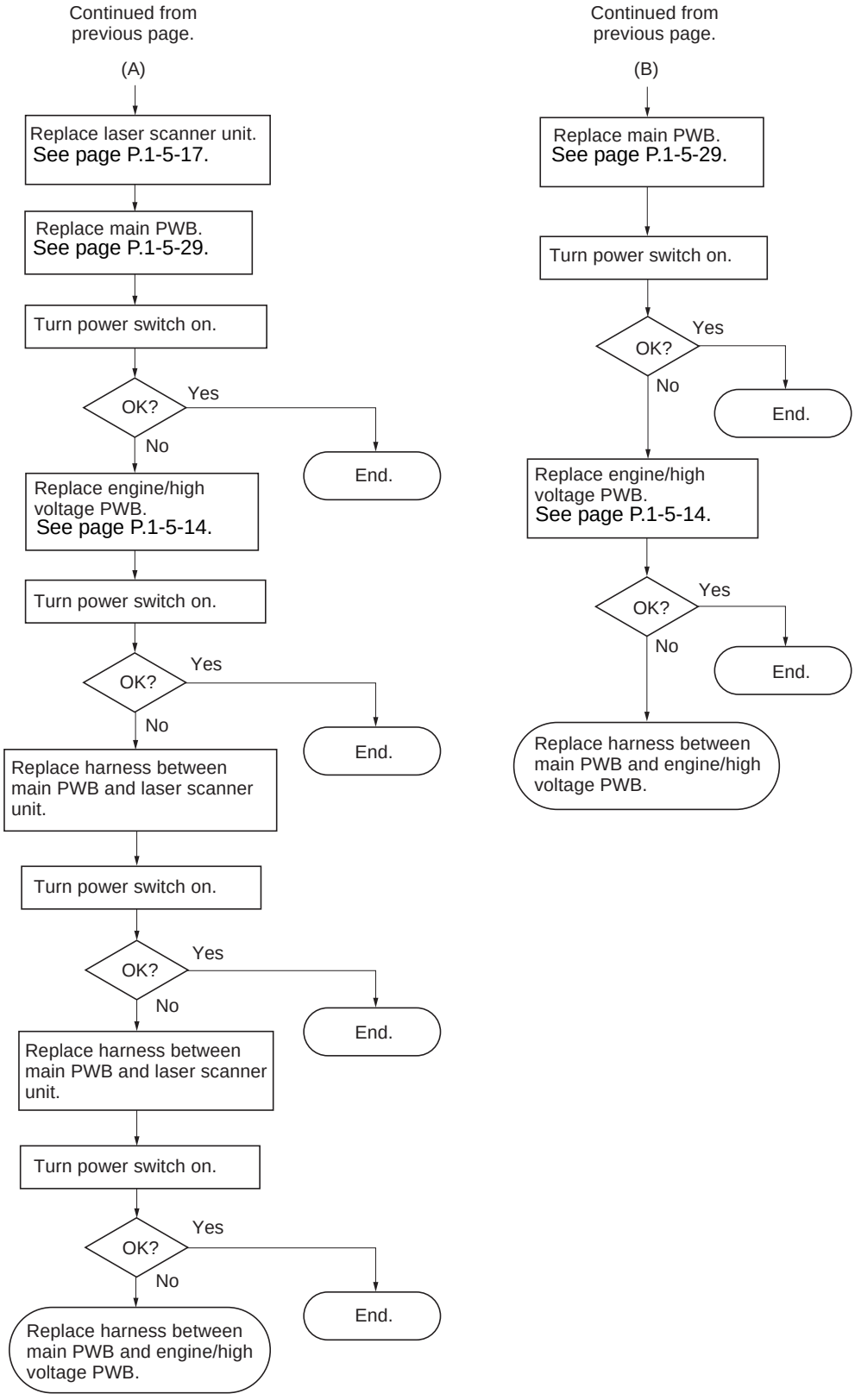

Start
Reinsert the connector of harness between engine/high voltage PWB and main motor.
OK?
No
Yes
Connect circuit tester to pin 1 of CN1 connector on the main motor.
24 V DC at pin 1 of CN1 connector on the main motor?
No
Yes
Replace harness between engine/high voltage PWB and main motor.
Connect circuit tester to pin 5 (REMOTE) of YC5 connector on the engine/high voltage PWB.
Turn printer power switch off, then on.
Print status page.
Does pin 5 (REMOTE) of YC5 connector on the engine/high voltage PWB goes high, then low?
Yes
No
Replace engine/high voltage PWB.
See page P.1-5-14.
Connect oscilloscope to pin 5 (REMOTE) and pin 3 (MMOTRDY) of CN1 connector on the main motor.
Turn printer power switch off, then on.
Print status page.
Does pin 3 (MMOTRDY) of CN1 connector on the main motor goes high, then low, within 2 seconds from pin 5 (REMOTE) goes low?
No
Yes
Replace the main motor. If not solved, check or replace drive unit.
See page P.1-5-21.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
4000	**Polygon motor (laser scanner unit) error** The polygon motor ready input is not given for eight seconds during the polygon motor is driven.	Defective harness between engine/high voltage PWB and laser scanner unit.	Follow the flow chart.
		Defective engine/high voltage PWB.	
		Defective polygon motor (laser scanner unit).	

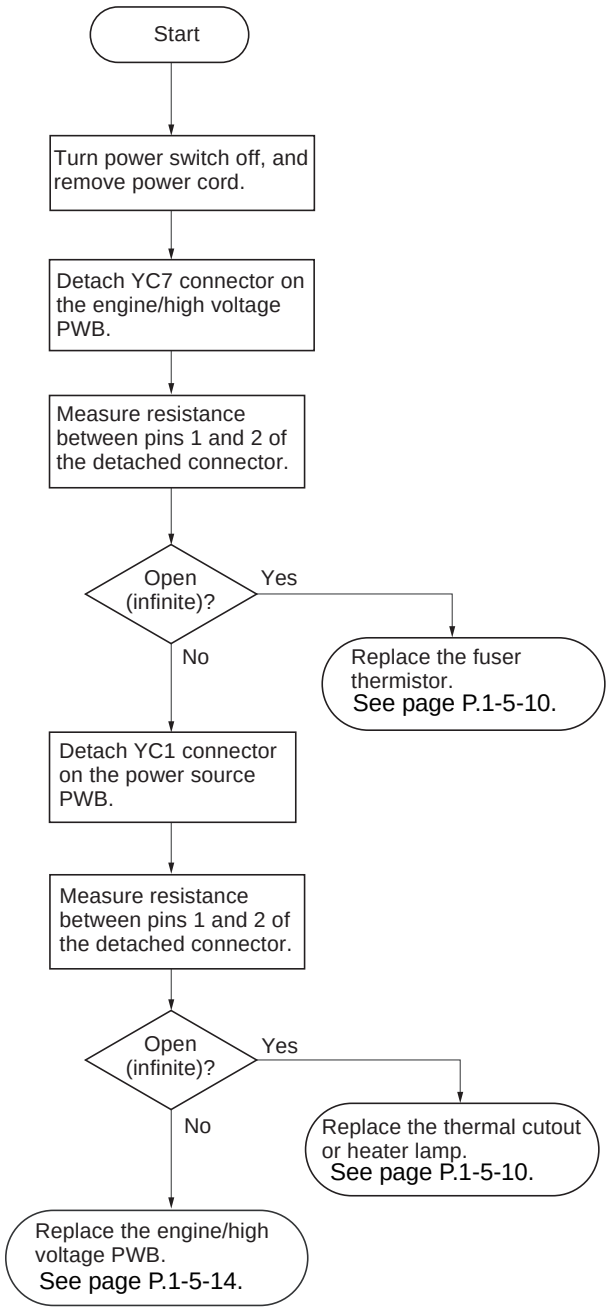

Start
+24 V DC at pin 5 of YC3 connector on the engine/high voltage PWB?
No
Replace engine/high voltage PWB. See page P.1-5-14.
Yes
Connect oscilloscope to pin 1 (PLGCLK) and pin 3 (PLGON) of YC3 connector on the engine/high voltage PWB.
Turn power switch off, then on.
Does pin 3 (PLGON) of YC3 connector on the engine/high voltage PWB goes high, then low?
No
Replace engine/high voltage PWB. See page P.1-5-14.
Turn power switch on.
Yes
*:1417 Hz (705 µs)
Does pin 1 (PLGCLK) of YC3 connector on the engine/high voltage PWB output square-wave* signal?
No
Replace engine/high voltage PWB. See page P.1-5-14.
Yes
Connect oscilloscope to pin 2 (PLGDRY) and pin 3 (PLGON) of YC3 connector on the engine/high voltage PWB.
Turn power switch off, then on.
Does pin 2 (PLGDRY) of YC3 connector on the engine/high voltage PWB goes high, then low, within 8 seconds after pin 5 (REMOTE) goes high, then low?
Yes
Replace engine/high voltage PWB. See page P.1-5-14.
No
Replace laser scanner unit. See page P.1-5-17.
Turn power switch on.
OK?
Yes
End.
No
Replace harness between engine/high voltage PWB and laser scanner unit.
OK?
Yes
End.
No
Replace laser scanner unit. See page P.1-5-17.
Turn power switch on.
OK?
Yes
End.
No
Replace harness between engine/high voltage PWB and laser scanner unit.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
4200	**PD (Pin photo diode) sensor (laser scanner unit) error** The first BD input is not given for 10 seconds after power is turned on and the laser begins emitting. The first BD input is not given for 7 seconds during printing and after the laser begins emitting.	Defective main PWB.	Follow the flow chart.
		Defective harness between main PWB and engine/ high voltage PWB.	
		Defective engine/ high voltage PWB.	

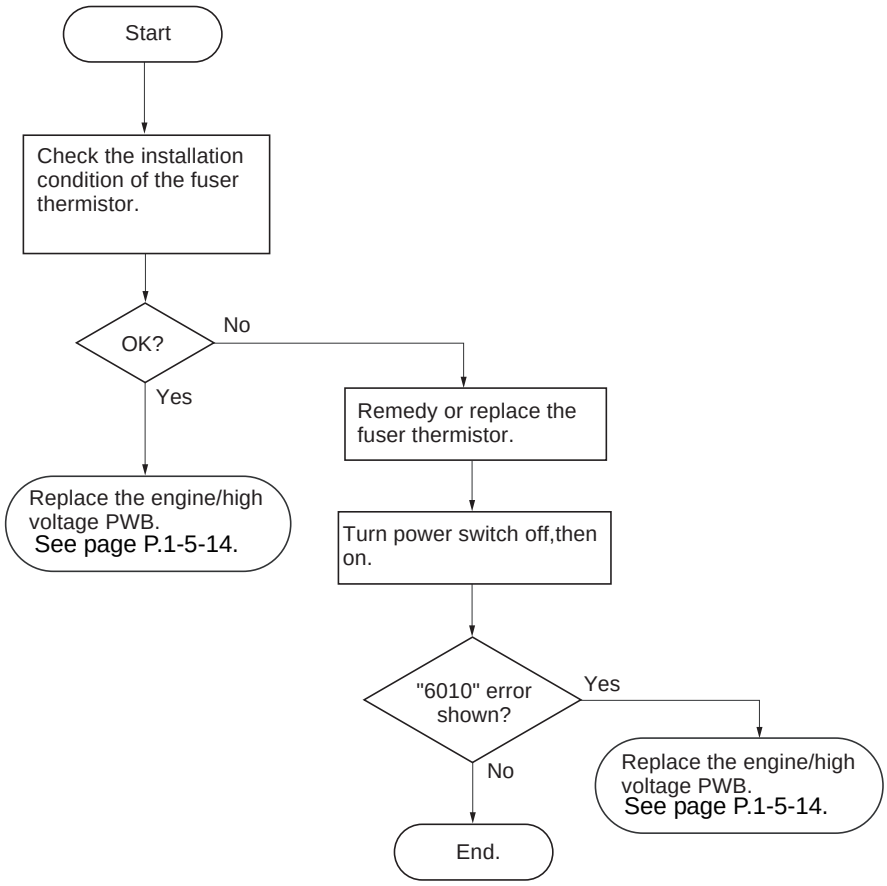

Start
5 V DC at pin 5 of J7 connector on the main PWB?
No
Replace main PWB.
See page P.1-5-29.
Yes
Connect oscilloscope to pin 3 (OUTPEN) of J7 connector on the main PWB.
Turn power switch off,then on.
Does pin 3 (OUTPEN) of J7 connector on the main PWB goes high, then before "4200" error?
No
Replace main PWB.
See page P.1-5-29.
Turn power switch on.
OK?
No
Yes
End.
Replace engine/high voltage PWB.
See page P.1-5-14.
Turn power switch on.
OK?
No
Yes
End.
Replace harness between main PWB and engine/high voltage PWB.
Yes
Connect oscilloscope to pin 3 (OUTPEN) and pin 7 (PDN) of J7 connector on the main PWB.
Turn power switch off,then on.
Does pin 7 (PDN) of J7 connector on the main PWB output pulse signal*, within 0.1 second after pin 3 (OUTPEN) goes high, then low?
Yes
No
*: Pin photo diode sensor detect horizontal synchronization signal (Frequency: 1417 Hz, Low level width: 10 µs)
(A)
Continued to next page.
(B)
Continued to next page.

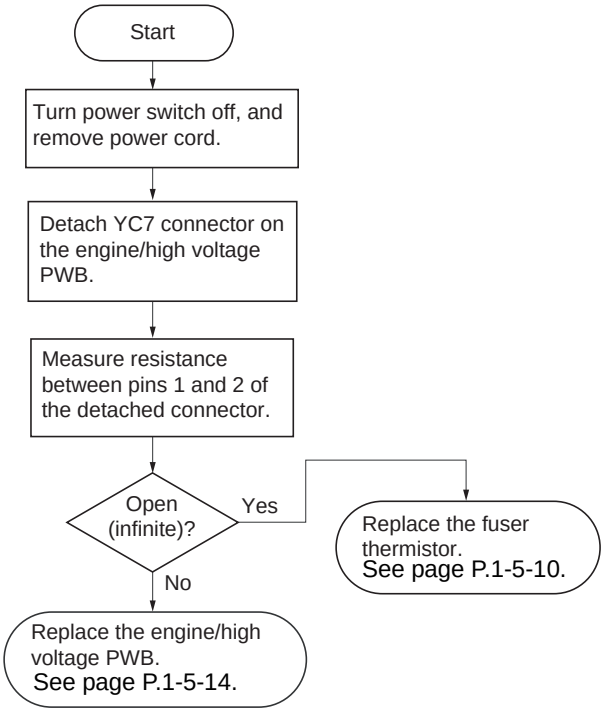
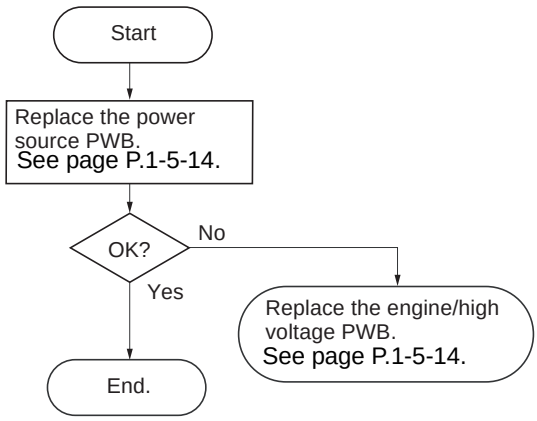
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
4200 cont.			

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6000	**Broken heater lamp error** The temperature won't rise by 1°C/33.8 °F during warming up and the heater is turned on for 5 seconds. The temperature won't rise by 1°C/33.8 °F during printing and the heater is turned on for 5 seconds with the duty cycle more than 60%.	Defective fuser thermistor.	Follow the flow chart.
		Broken thermal cutout or heater lamp.	
		Defective engine/ high voltage PWB.	

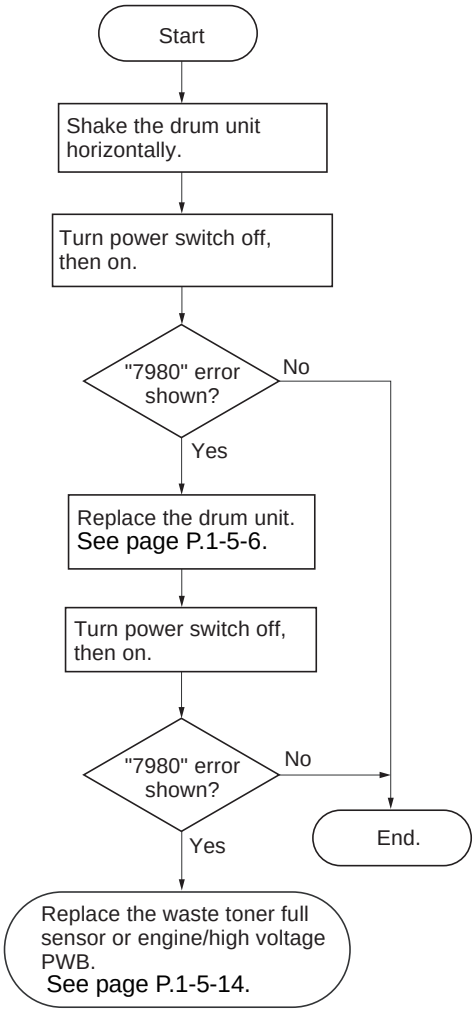

Start
Turn power switch off, and remove power cord.
Detach YC7 connector on the engine/high voltage PWB.
Measure resistance between pins 1 and 2 of the detached connector.
Open (infinite)?
Yes
No
Replace the fuser thermistor.
See page P.1-5-10.
Detach YC1 connector on the power source PWB.
Measure resistance between pins 1 and 2 of the detached connector.
Open (infinite)?
Yes
No
Replace the thermal cutout or heater lamp.
See page P.1-5-10.
Replace the engine/high voltage PWB.
See page P.1-5-14.

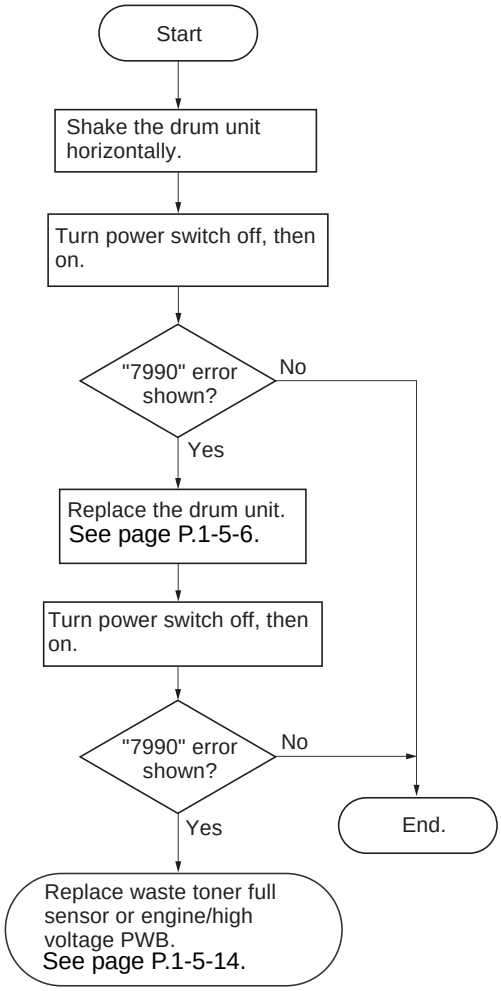
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6010	**Fuser low temperature** After the fuser heater lamp is turned on, the temperature at the upper fuser roller lower than 100 °C/212 °F continues for 30 s.	Defective the fuser thermistor.	Follow the flow chart.
		Defective the engine/high voltage PWB.	



<table>
<tr><th rowspan="2">Code</th><th rowspan="2">Contents</th><th colspan="2">Remarks</th></tr>
<tr><th>Causes</th><th>Check procedures/corrective measures</th></tr>
<tr><td rowspan="2">6050</td><td rowspan="2">Broken fuser thermistor
The thermistor AD value is less than 1 for 600 ms.</td><td>Defective the fuser thermistor.</td><td rowspan="2">Follow the flow chart.</td></tr>
<tr><td>Defective the engine/high voltage PWB.</td></tr>
<tr><td></td><td colspan="3"> 
</td></tr>
<tr><td rowspan="3">6400</td><td rowspan="3">Zero cross signal error
While fuser heater ON/OFF control is performed, the zero-cross signal is not input within 3 s.</td><td>Defective the power source PWB.</td><td rowspan="2">Follow the flow chart.</td></tr>
<tr><td>Defective the engine/high voltage PWB.</td></tr>
<tr><td colspan="3"> 
</td></tr>
</table>

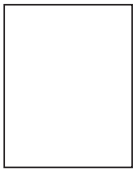
Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7980	**Waste toner full (Total page count less than 100,000 pages of printing)** The toner-full sensor has detected that the waste toner is full before the total print page of less than 100,000 pages.	Defective drum unit.	Follow the flow chart.
		Defective waste toner full sensor.	
		Defective engine/ high voltage PWB.	



<table>
<tr><th rowspan="2">Code</th><th rowspan="2">Contents</th><th colspan="2">Remarks</th></tr>
<tr><th>Causes</th><th>Check procedures/corrective measures</th></tr>
<tr><td rowspan="2">7990</td><td rowspan="3">Waste toner full (Total page count more than 100,000 pages of printing)
The toner-full sensor has detected that the waste toner is full before the total print page of more than 100,000 pages.</td><td>Defective drum unit.</td><td rowspan="3">Follow the flow chart.</td></tr>
<tr><td>Defective waste toner full sensor.
Defective engine/ high voltage PWB.</td></tr>
<tr><td colspan="3"> 
</td></tr>
<tr><td rowspan="2">F040 (E0)</td><td rowspan="2">Main - Engine communication error
The communication breakdown occurred between the main PWB and the engine/ high voltage PWB during the predetermined period in seconds.</td><td>Defective engine/ high voltage PWB.</td><td>Replace the engine/high voltage PWB (See page P.1-5-14)</td></tr>
<tr><td>Defective main PWB.</td><td>Replace the main PWB (See page P.1-5-29).</td></tr>
<tr><td>F050 (E6)</td><td>Engine checksum error
Checksum result failed with the CPU and engine/high voltage PWB.</td><td>Defective engine/ high voltage PWB.</td><td>Replace the engine/high voltage PWB (See page P.1-5-14).</td></tr>
</table>

1-4-3 Image formation problems

(1) Completely blank printout.

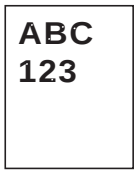


See page P.1-4-15

(2) All-black printout.

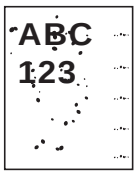
See page P.1-4-15

(3) Dropouts.



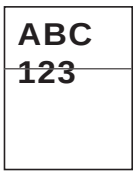
See page P.1-4-16

(4) Black dots.



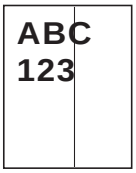
See page P.1-4-16

(5) Black horizontal streaks.



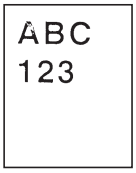
See page P.1-4-16

(6) Black vertical streaks.



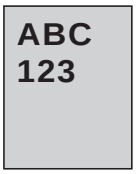
See page P.1-4-17

(7) Unsharpness.



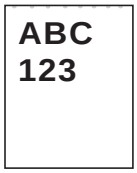
See page P.1-4-17

(8) Gray background.



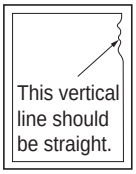
See page P.1-4-18

(9) Dirt on the top edge or back of the paper.



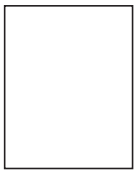
See page P.1-4-18

(10) Undulated printing at the right edge (scanning start position).



See page P.1-4-18

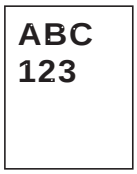
(1) Completely blank printout

Copy example	Causes	Check procedures/corrective measures
	Defective drum unit or developer unit.	Open the printer top cover and check that the drum unit and developer unit is correctly seated. Check for poor contact of the main charger terminal between the main charger unit and the drum unit.
	Defective transfer bias potential.	Check the transfer bias output on the engine/high voltage PWB. This requires removal of the left cover and the test equipment. Replace the engine/high voltage PWB if high voltage potential is not available on the PWB (See page P.1-5-14).
	Defective laser scanner unit.	The scanner components within the scanner may be disordered. Replace the laser scanner unit (See page P.1-5-17).
	Defective main PWB.	Defective laser scanner unit control circuit in the main PWB (See page P.1-5-29).

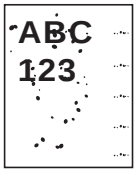
(2) No image appears (entirely black).

Copy example	Causes	Check procedures/corrective measures
	Defective main charger unit.	Open the printer top cover and check that the drum unit is correctly seated. Check for poor contact of the main charger terminal between the main charger unit and the drum unit.
	Defective main charger high voltage output.	Make sure the main charger high voltage output from the engine/high voltage PWB correctly arrives at the drum unit (main charger unit).
	Defective engine/high voltage PWB.	Check the high voltage output on the engine/high voltage PWB. Replace the engine/high voltage PWB if high voltage potential is not available on the PWB (See page P.1-5-14).
	Defective main PWB.	Replace the main PWB (See page P.1-5-29).

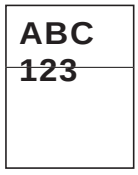
(3) Dropouts

Copy example	Causes	Check procedures/corrective measures
	Defective developing roller (in the developer unit).	If the defects occur at regular intervals of 47.2 mm/1 7/8", the problem may be the damaged developing roller (in the developer unit). Replace the developer unit (See page P.1-5-6).
	Defective drum unit.	Defective drum unit. If the defects occur at regular intervals of 94 mm/3 11/16", the problem may be the damaged drum (in the drum unit). Replace the drum unit (See page P.1-5-6).
	Defective fuser unit.	Defective fuser unit. If the defects occur at regular intervals of 63 mm/2 1/2" (heat roller or press roller), the problem may be the damaged fuser unit. Replace the press roller or heat roller (See page P.1-5-10).
	Defective paper specifications.	Defective paper specifications. Paper with rugged surface or dump tends to cause dropouts. Replace paper with the one that satisfies the paper specifications.
	Defective transfer roller installation.	The transfer roller must be supported by the bushes at the both ends. Clean the bush to remove oil and debris. Replace the transfer roller if necessary (See page P.1-5-5).
	Defective engine/high voltage PWB (transfer bias potential).	Check the transfer bias output on the engine/high voltage PWB. This requires removal of the left cover and the test equipment. Replace the engine/high voltage PWB if high voltage potential is not available on the PWB (See page P.1-5-14).

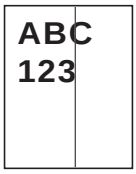
(4) Black dots

Copy example	Causes	Check procedures/corrective measures
	Defective drum unit.	Defective drum unit. If the defects occur at regular intervals of 94 mm/3 11/16", the problem may be the damaged drum (in the drum unit). Replace drum unit (See page P.1-5-6). If the defects occur at random intervals, the toner may be leaking from the developer unit and drum unit. Replace developer unit and drum unit (See page P.1-5-6).

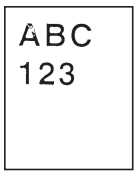
(5) Black horizontal streaks

Copy example	Causes	Check procedures/corrective measures
	Defective drum unit's ground.	Defective drum unit's ground. The drum axle in the drum unit and its counter part, the grounding tab in the machine, must be in a good contact. If necessary, apply a small amount of electro-conductive grease onto the tab.
	Defective drum unit.	Defective drum unit. Replace the drum unit (See page P.1-5-6).

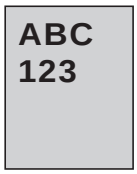
(6) Black vertical streaks

Copy example	Causes	Check procedures/corrective measures
	Contaminated main charger wire.	Contaminated main charger wire. Clean the main charger wire by sliding the green colored cleaning knob in and out several times.
	Defective drum surface.	Defective drum surface. A streak of toner remaining on drum after printing means that the cleaning blade (in the drum unit) is not working properly. Replace the drum unit (See page P.1-5-6).
	Defective magnet roller (in the developer unit).	Defective magnet roller (in the developer unit). Replace the developer unit (See page P.1-5-6).

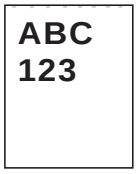
(7) Unsharpness

Copy example	Causes	Check procedures/corrective measures
	Defective paper specifications.	Defective paper specifications. Paper with rugged surface or dump tends to cause unsharp printing.
	Defective transfer roller installation.	Defective transfer roller installation. The transfer roller must be supported by the bushes at the both ends. Clean the bush to remove oil and debris. Replace the transfer roller if necessary (See page P.1-5-5).
	Defective transfer bias potential.	Defective transfer bias potential. Check the transfer bias output on the engine/high voltage PWB. This requires removal of the left cover and the test equipment. Replace the engine/high voltage PWB if high voltage potential is not available on the PWB (See page P.1-5-14).
	EcoPrint mode setting.	EcoPrint mode setting. The EcoPrint mode can provides faint, unsharp printing because it acts to conserve toner for draft printing purpose. For normal printing, turn the EcoPrint mode off by using the operator panel. For details refer to the operation guide.

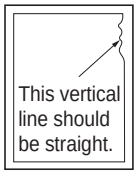
(8) Gray background

Copy example	Causes	Check procedures/corrective measures
	Print density setting.	Print density setting. The print density may be set too high. Try adjusting the print density. For details refer to the operation guide.
	Defective drum surface potential.	Defective drum surface potential. The drum surface potential should be approximately 470±15 V. This may vary depending on production lots. Measurement is possible only by using the jig and tool specifically designed for this purpose. The drum unit will have to be replaced if it bears values far out of the allowable range.
	Defective main charger grid.	Defective main charger grid. Clean the main charger grid.
	Developing roller (in the developer unit).	Defective developing roller (in the developer unit). If a developer unit which is known to work normally is available for check, replace the current developer unit with the normal one. If the symptom disappears, replace the developer unit with a new one (See page P.1-5-6).

(9) Dirt on the top edge or back of the paper

Copy example	Causes	Check procedures/corrective measures
	Toner contamination in various parts.	Toner contamination in various parts. Dirty edges and back of the paper can be caused by toner accumulated on such parts as the paper chute, paper transportation paths, the bottom of the drum and developer, and the fuser unit inlet. Clean these areas and parts to remove toner.
	Defective transfer roller.	Defective transfer roller. If the transfer roller is contaminated with toner, clean the transfer roller using a vacuum cleaner or by continuously printing a low-density page until the symptom has faded away.

(10) Undulated printing at the right edge (scanning start position)

Copy example	Causes	Check procedures/corrective measures
	Defective laser scanner unit.	Defective laser scanner unit. Defective polygon motor in the laser scanner unit. Replace the laser scanner unit (See page P.1-5-17).
	Defective engine controller circuit in the engine/high voltage PWB.	Defective engine controller circuit in the engine/high voltage PWB. Replace the engine/high voltage PWB (See page P.1-5-14).

1-4-4 Electric problems

Problem	Causes	Check procedures/corrective measures
(1)The machine does not operate when the power switch is turned on.	No electricity at the power outlet.	Measure the input voltage.
	The power cord is not plugged in properly.	Check the contact between the power plug and the outlet.
	The top cover is not closed-completely.	Check the top cover.
	Broken power cord.	Check for continuity. If none, replace the cord.
	Defective power switch.	Check for continuity across the contacts. If none, replace the power source PWB (See page P.1-5-14).
	Blown fuse in the power source PWB.	Check for continuity. If none, remove the cause of blowing and replace the fuse.
	Defective interlock switch.	Check for continuity across the contacts of interlock switch. If none, replace the engine/high voltage PWB (See page P.1-5-14).
	Defective power source PWB or engine/high voltage PWB.	With AC present, check for 5 V DC at YC4-11, YC7-2, YC10-1, YC6-1, and 24 V DC at YCYC3-5, YC3-6, YC5-1 YC9-1 on the engine/high voltage PWB. If none, replace the power source PWB or engine/high voltage PWB (See page P.1-5-14).
(2)The main motor does not operate (Self diagnostic code 2000).	Poor contact in the main motor connector terminals.	Reinsert the connector. Also check for continuity within the connector harness. If none, remedy or replace the harness.
	Broken main motor gear.	Check visually and replace the main motor if necessary.
	Defective main motor.	Replace the main motor (See page P.1-5-21).
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB (See page P.1-5-14).
(3)The cooling fan motor does not operate.	Broken cooling fan motor coil.	Check for continuity across the coil. If none, replace the cooling fan motor.
	Poor contact in cooling fan motor connector terminals.	Reinsert the connector.
(4)The power source fan motor does not operate.	Broken power source fan motor coil.	Check for continuity across the coil. If none, replace the power source fan motor.
	Poor contact in power source fan motor connector terminals.	Reinsert the connector.
(5)The registration clutch does not operate.	Broken registration clutch coil.	Check for continuity across the coil. If none, replace the registration clutch.
	Poor contact in the registration clutch connector terminals.	Reinsert the connector.
	Defective harness between connect PWB and engine/ high voltage PWB.	Check for continuity across the harness. If none, replace the charness.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB (See page P.1-5-14).
	Defective connect PWB.	Replace the connect PWB.

Problem	Causes	Check procedures/corrective measures
(6)The feed clutch does not operate.	Broken feed clutch coil.	Check for continuity across the coil. If none, replace the feed clutch.
	Poor contact in the feed clutch connector terminals.	Reinsert the connector.
	Defective harness between connect PWB and engine/ high voltage PWB.	Check for continuity across the harness. If none, replace the charness.
	Defective engine/high voltage PWB.	Replace the engine/high voltage PWB (See page P.1-5-14).
	Defective connect PWB.	Replace the connect PWB.
(7)The eraser lamp (PWB) does not turn on.	Poor contact in the eraser lamp (PWB) connector terminals.	Reinsert the connector.
	Defective eraser lamp (PWB).	Check for continuity. If none, replace the eraser lamp (PWB) (See page P.1-5-19).
	Defective engine/high voltage PWB.	If the eraser lamp (PWB) turns on when YC8-2 on the engine/high voltage PWB is held low, replace the engine/high voltage PWB (See page P.1-5-14).
(8)The heater lamp does not turn on.	Broken wire in heater lamp.	Check for continuity across each heater lamp. If none, replace the heater lamp (See page P.1-5-10).
	Thermal cutout triggered.	Check for continuity across thermal cutout. If none, remove the cause and replace the thermal cutout (See page P.1-5-10).
(9)The heater lamp does not turn off.	Broken fuser thermistor.	Measure the resistance. If it is $\infty\Omega$, replace the fuser thermistor (See page P.1-5-10).
	Dirty sensor part of the fuser thermistor.	Check visually and clean the fuser thermistor sensor parts (See page P.1-5-10).
(10)No main charging.	Poor insertion main charger unit.	(See page P.1-4-15).
	Broken main charger wire.	
	Poor contact of main charger terminal and high voltage output terminal on the engine/high voltage PWB.	
	Defective engine/high voltage PWB.	
(11)No developing bias is output.	Poor insertion developer unit.	(See page P.1-5-6, P.1-5-14).
	Poor contact of developing bias terminal spring and high voltage output terminal (TAB1) on the engine/ high voltage PWB.	
	Defective engine/high voltage PWB.	

Problem	Causes	Check procedures/corrective measures
(12)No transfer bias is output.	Poor contact of transfer bias terminal and transfer bias terminal (J1, J2, J3) on the engine/high voltage PWB.	(See page P.1-5-14).
	Defective engine/high voltage PWB.	
(13)The message requesting paper to be loaded is shown when paper is present in the paper cassette.	Defective paper sensor on the engine/high voltage PWB.	Replace the engine/high voltage PWB (See page P.1-5-14).
(14)A paper jam in the paper feeding/ conveying section or fuser section is indicated when the power switch is turned on.	A piece of paper torn from paper is caught around registration sensor or exit sensor.	Check and remove if any.
	Defective registration sensor on the engine/high voltage PWB.	Replace the engine/high voltage PWB (See page P.1-5-14).
	Defective exit sensor on the power source PWB.	Replace the power source PWB (See page P.1-5-14).
(15)The indicator requesting cover to be closed is displayed when the top cover is closed.	Defective interlock switch on the engine/high voltage PWB.	Check for continuity across the interlock switch. If there is no continuity when the interlock switch is on, replace the engine/high voltage PWB (See page P.1-5-14).

1-4-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the feed roller is dirty with paper powder.	Clean with isopropyl alcohol.
	Check if the paper feed roller is deformed.	Check visually and replace any deformed paper feed roller. See page 1-6-4.
	Defective feed clutch installation.	Check visually and remedy if necessary.
(2) No secondary paper feed.	Check if the surfaces of the upper and lower registration rollers are dirty with paper powder.	Clean with isopropyl alcohol.
	Defective registration clutch installation.	Check visually and remedy if necessary.
(3) Skewed paper feed.	Paper width guide in a cassette installed incorrectly.	Check the paper width guide visually and correct or replace if necessary.
(4) Multiple sheets of paper are fed at one time.	Check if the separator pad is worn.	Replace the separator pad if it is worn.
	Check if the paper is curled.	Change the paper.
(5) Paper jams.	Check if the paper is excessively curled.	Change the paper.
	Check if the contact between the upper and lower registration rollers is correct.	Check visually and remedy if necessary.
	Check if the upper and lower fuser roller is extremely dirty or deformed.	Clean or replace the upper and lower fuser roller.
	Check if the contact between the FD roller and FD pulley is correct.	Check visually and remedy if necessary.
(6) Toner drops on the paper conveying path.	Check if the drum unit or developer unit is extremely dirty.	Clean the drum unit or developer unit.
(7) Abnormal noise is heard.	Check if the pulleys, rollers and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic clutches are installed correctly: Feed clutch and registration clutch.	Check visually and remedy if necessary.

1-5-1 Precautions for assembly and disassembly

(1) Precautions

Be sure to turn the power switch off and disconnect the power plug before starting disassembly.
When handling PWBs, do not touch connectors with bare hands or damage the board.
Do not touch any PWB containing ICs with bare hands or any object prone to static charge.
Use only the specified parts to replace the fixing unit thermostat. Never substitute electric wires, as the copier may be seriously damaged.
When removing the hook of the connector, be sure to release the hook.

1-5-2 Outer covers and scanner unit

(1) Detaching and refitting the right cover, left cover and top cover

<Procedure>

1. Remove the paper cassette.
2. Open the scanner unit.
3. Open the front cover.
4. Remove the one screw.
5. Unlatch the four latches and then remove the right cover.

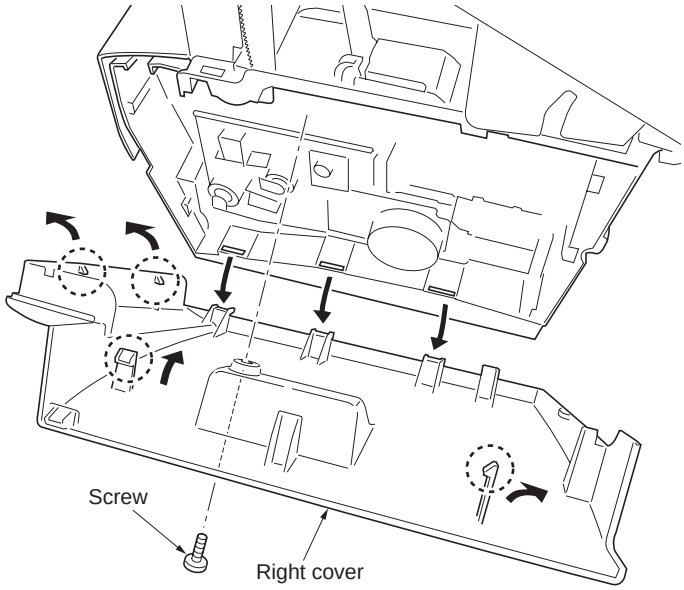


Figure 1-5-1Removing the right cover

6. Remove the one screw.
7. Unlatch the six latches and then remove the left cover.

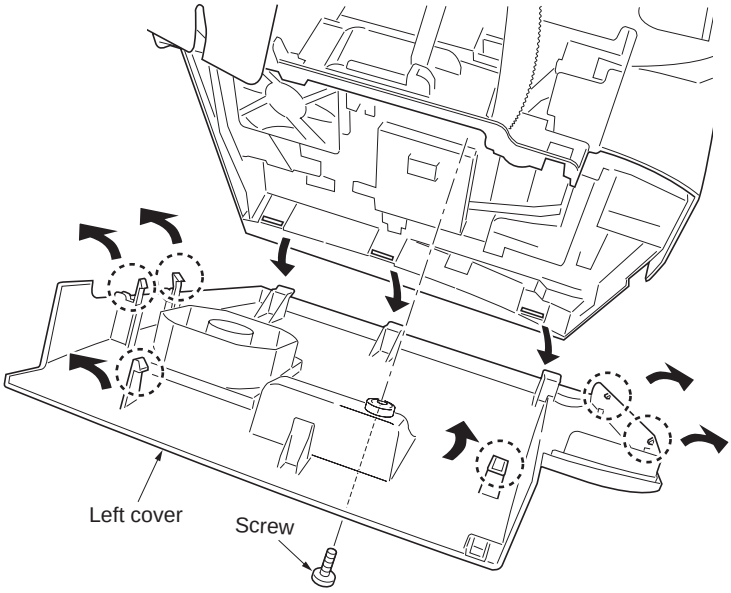


Figure 1-5-2Removing the left cover

8. Remove the scanner unit (See page P.1-5-22).
9. While opening the rear cover and then remove the two screws.
10. While unhooking the two hooks and then remove the top cover.

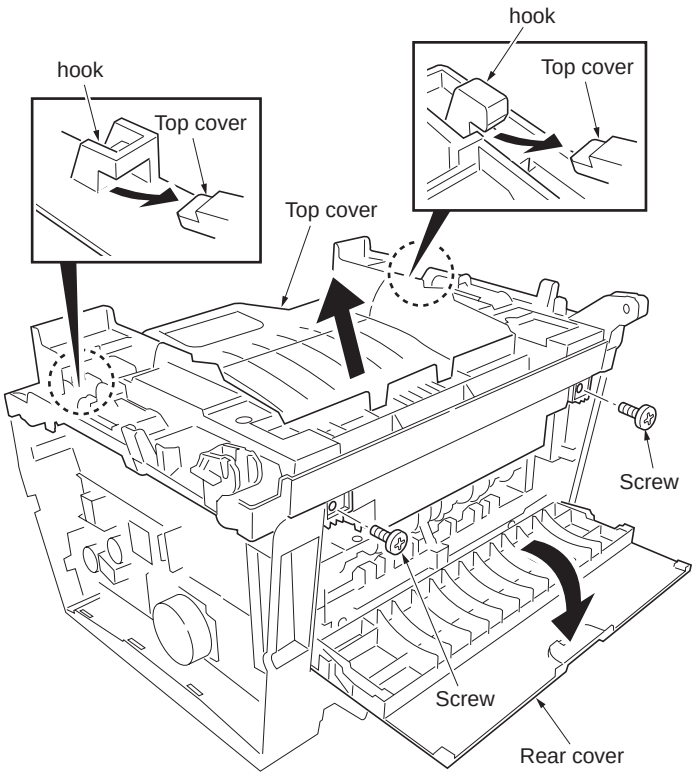


Figure 1-5-3

1-5-3 Paper feeding/conveying section

(1) Detaching and refitting the paper feed roller

<Procedure>

1. Remove the paper cassette.
2. Remove the paper feed roller.
3. Check or replace the paper feed roller and refit all the removed parts.

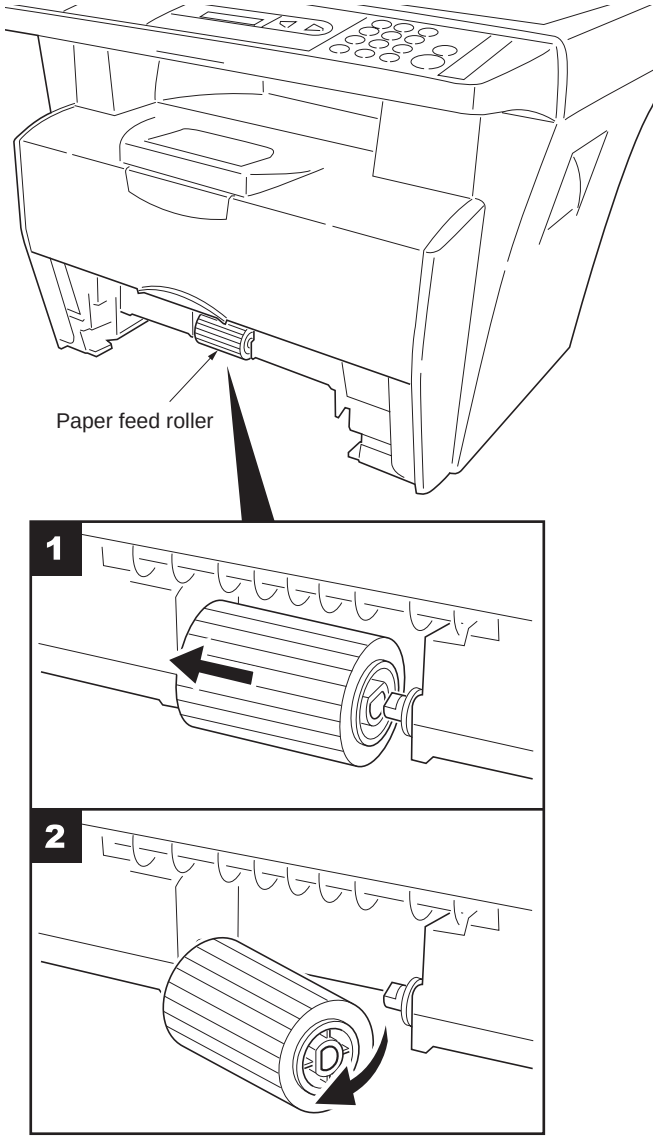


Figure 1-5-4Removing the paper feed roller

(2) Detaching and refitting the transfer roller

<Procedure>

1. Remove the developer unit and drum unit (See page P.1-5-6).
2. Remove the transfer roller from bushes.
3. Check or replace the transfer roller and refi all the removed parts.

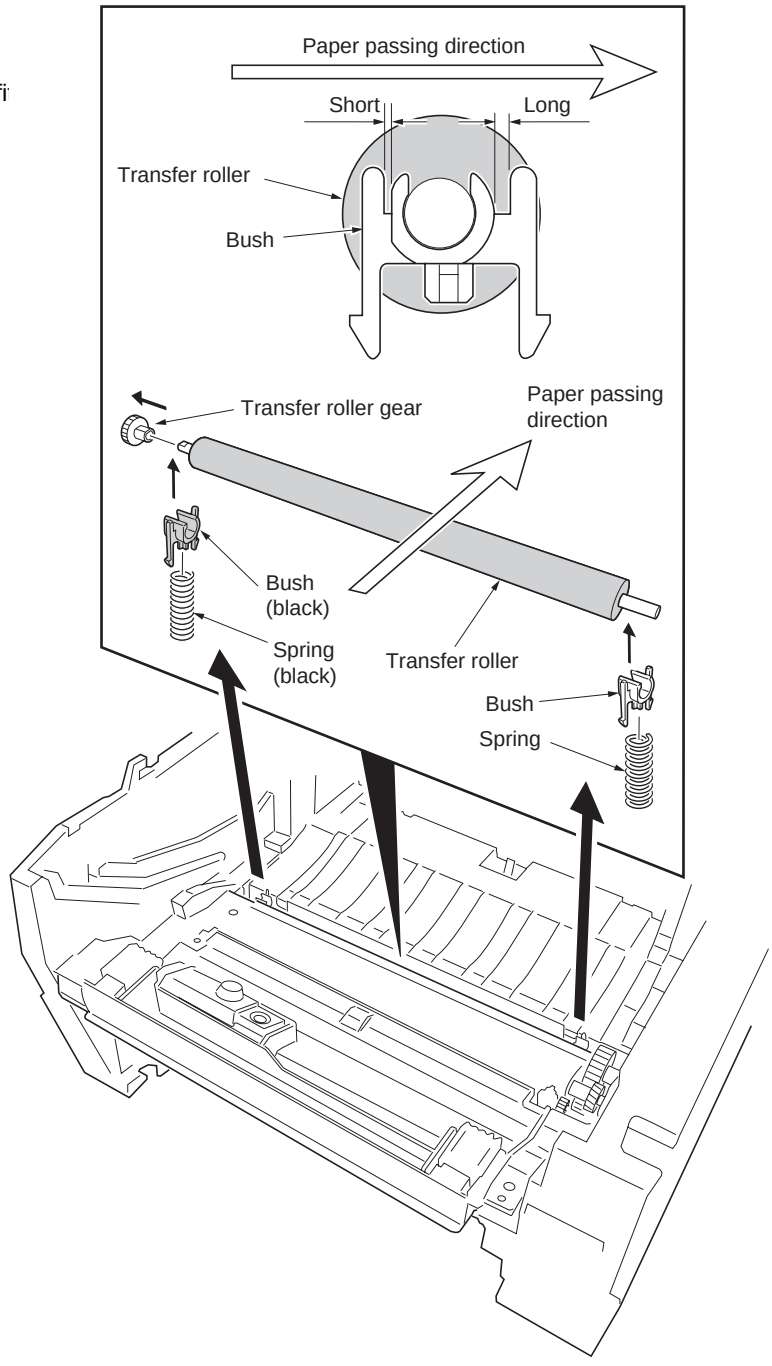


Figure 1-5-5Removing the transfer roller

1-5-4 Process section

(1) Detaching and refitting the developer unit and drum unit

<Procedure>

1. Open the scanner unit.
2. Open the front cover.
3. Remove the developer unit (with toner container.

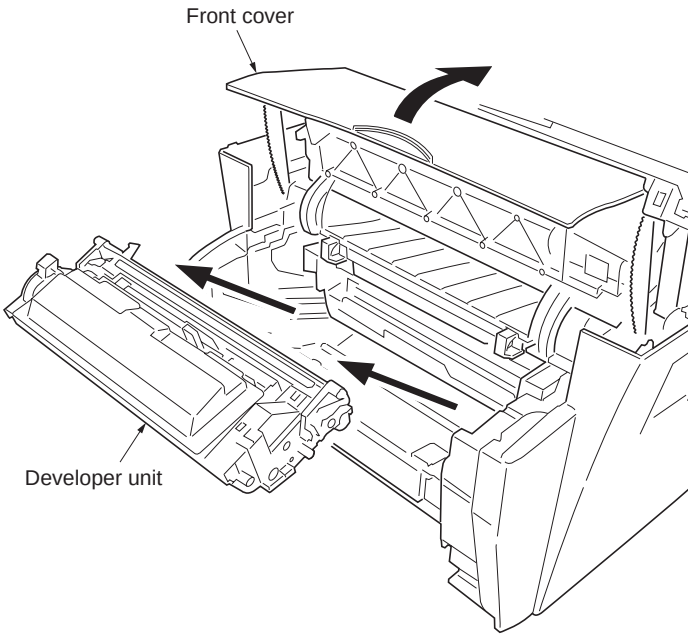


Figure 1-5-6Removing the developer unit

4. Remove the drum unit.
5. Check or replace the developer or drum unit and refit all the removed parts.

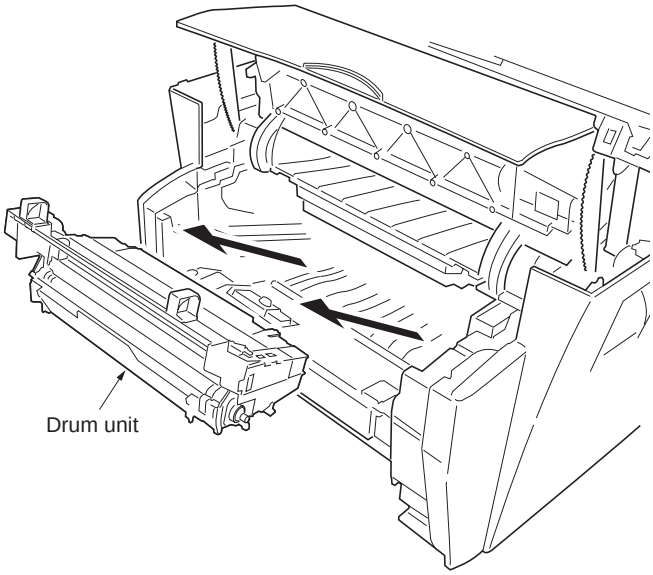


Figure 1-5-7Removing the drum unit

(2) Detaching and refitting the main charger unit

<Procedure>

1. Remove the drum unit (See page P.1-5-6).
2. While pushing on the main charger terminal (1), slide the main charger unit (2).
3. Remove the main charger unit (3) by lifting it.
4. Check or replace the main charger unit and refit all the removed parts.

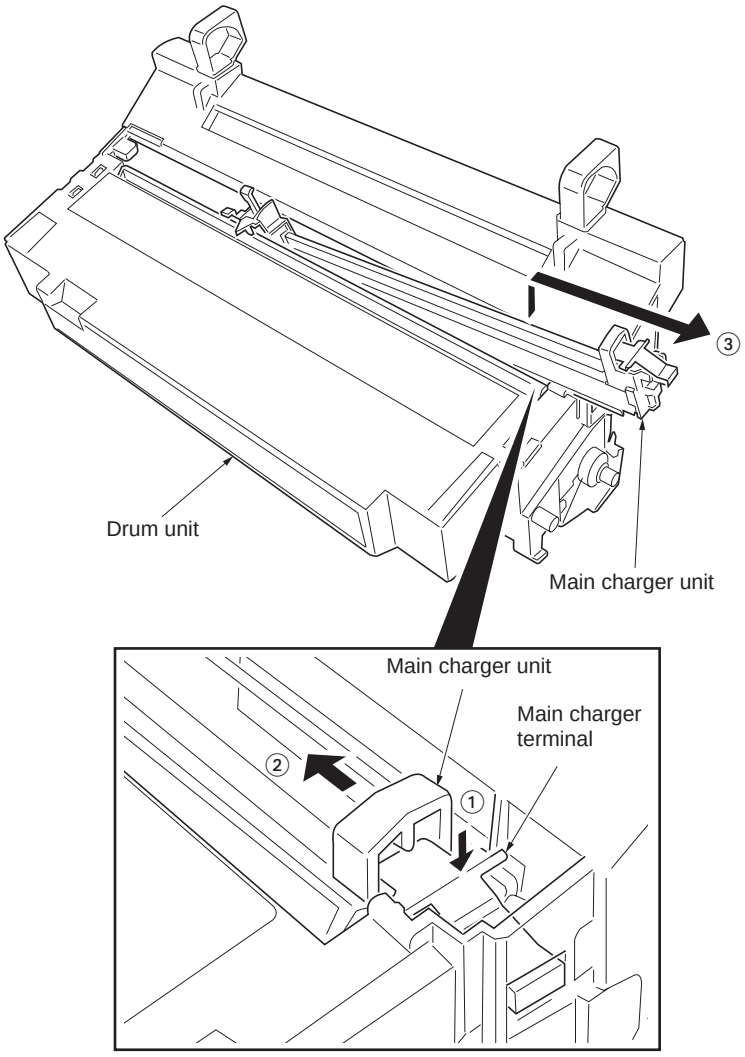


Figure 1-5-8

1-5-5 Fuser unit

(1) Detaching and refitting the fuser unit

<Procedure>

1. Remove the outer covers (See page P.1-5-2).
2. Remove the two connectors.
3. Remove the wire from two clamps.

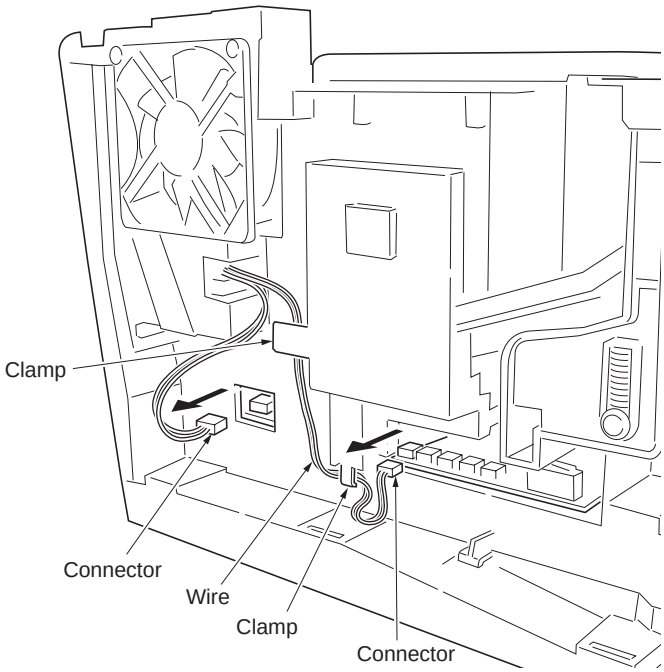


Figure 1-5-9

4. Pull out the rear cover axises (with springs) from the axis holes.

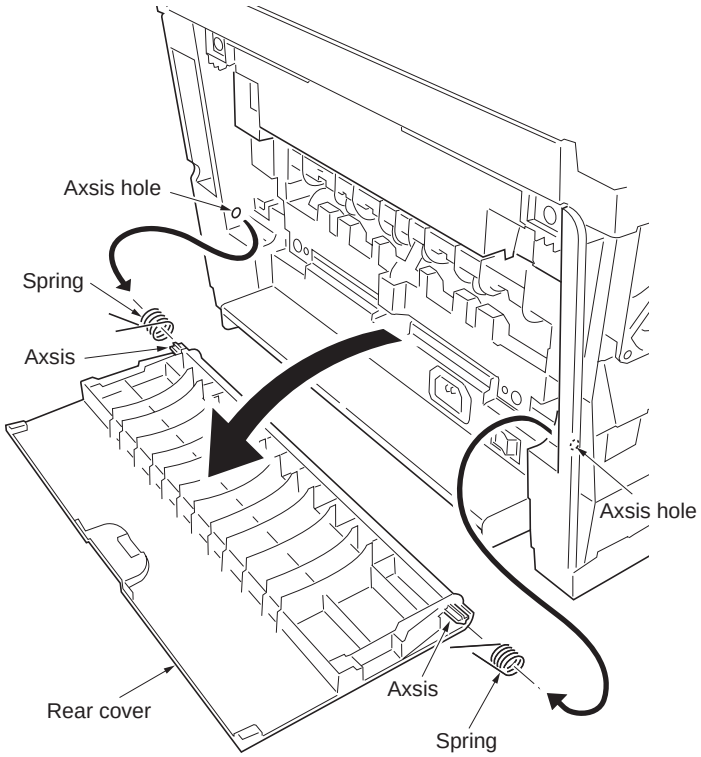


Figure 1-5-10

5. Remove the two screws and then remove the fuser unit.

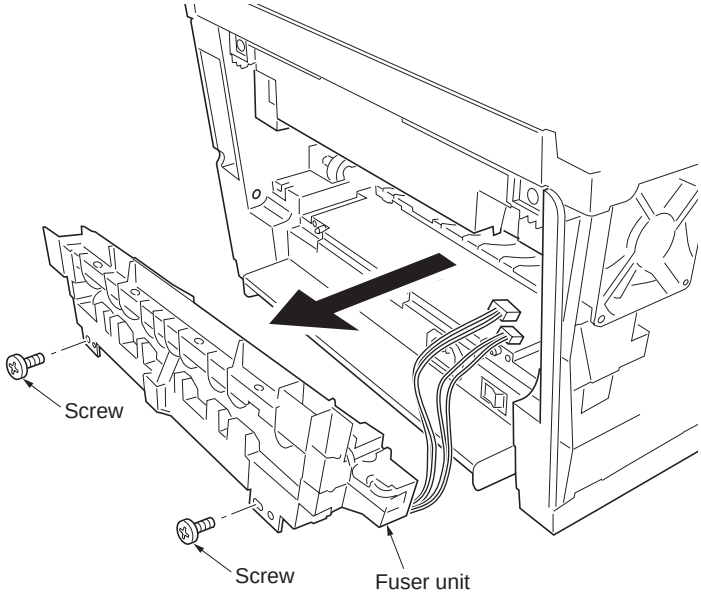


Figure 1-5-11

6. Remove the two screws and then separate the upper fuser frame and lower fuser frame.
7. Check or replace the fuser unit and refit all the removed parts.

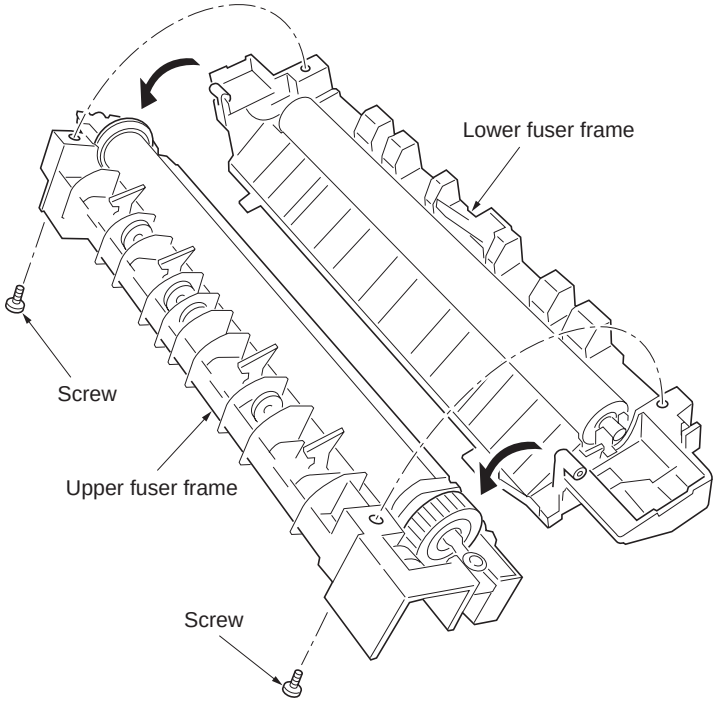


Figure 1-5-12

(2) Detaching and refitting the heater lamp, heat roller, fuser thermistor, thermal cutout, and press roller

<Procedure>

1. Remove the fuser unit (See page P.1-5-8).
2. Remove the two screws and terminal.
3. Remove the heater lamp.
   * Seat the heater lamp aligning its wattage mark and welding mark faced with the correct direction and side.

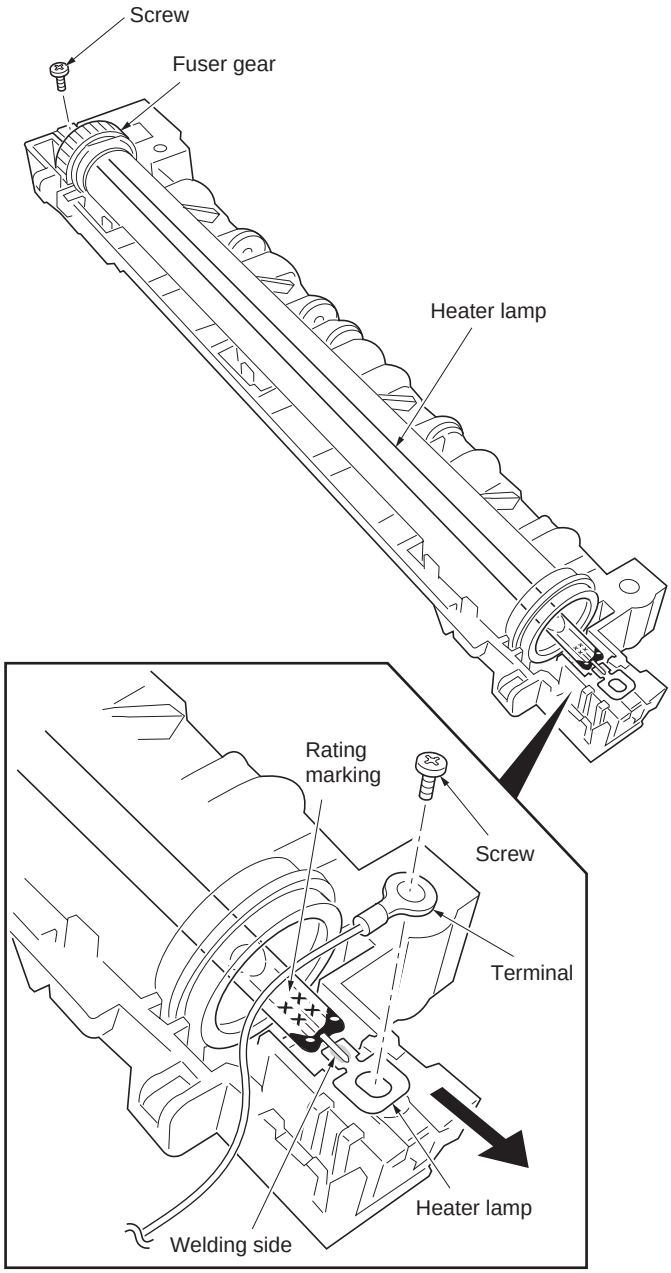


Figure 1-5-13

4. Pull the heat R bush and heat L bush (with heat roller) from the upper fuser guide.
5. Remove the heat R bush, heat L bush and heat gear from the heat roller.

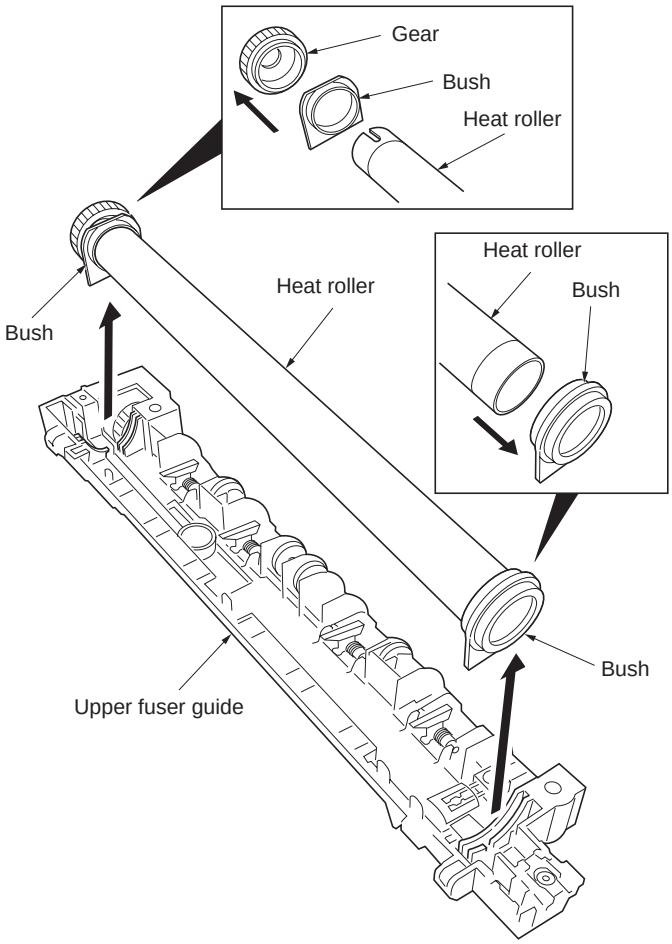


Figure 1-5-14

6. Remove the one screw and then remove the fuser thermistor.

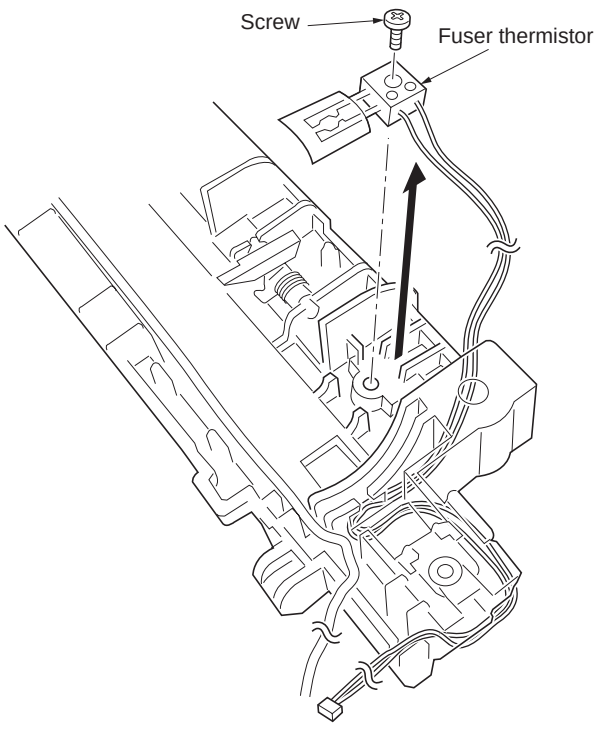


Figure 1-5-15

7. Remove the two screws (nuts), plate cord, and terminal.
8. Remove the thermal cutout.

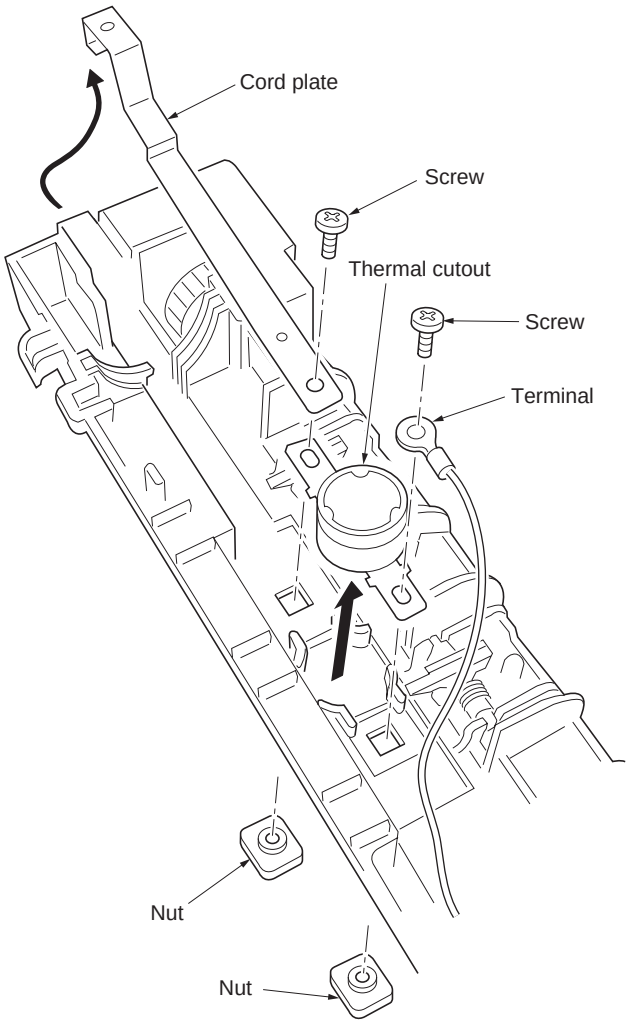


Figure 1-5-16

9. Remove the press roller from the bushes.
10. Check or replace the heater lamp, heat roller, fuser thermistor, thermal cutout, or press roller and refit all the removed parts.

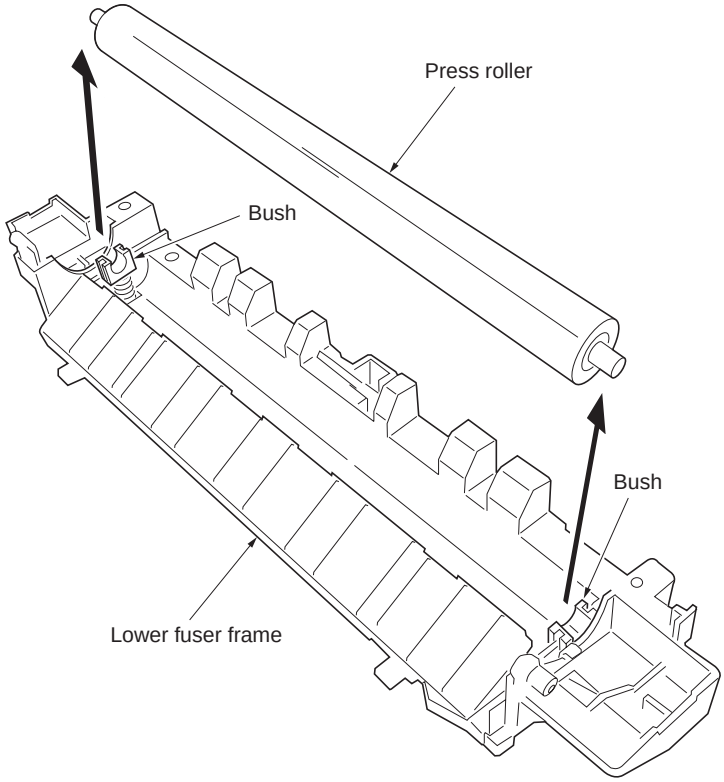


Figure 1-5-17Removing the press roller

(3) Detaching and refitting the engine/high voltage PWB and power source PWB

<Procedure>

1. Remove the developer unit and drum unit (See page P.1-5-6).
2. Remove the paper cassette.
3. Remove the scanner unit (See page P.1-5-22).
4. Remove the six connectors.
   * When seating the engine/high voltage PWB, ensure that the developer bias terminal spring is correctly in contact with the developing bias terminal (TB1) on the engine/high voltage PWB.

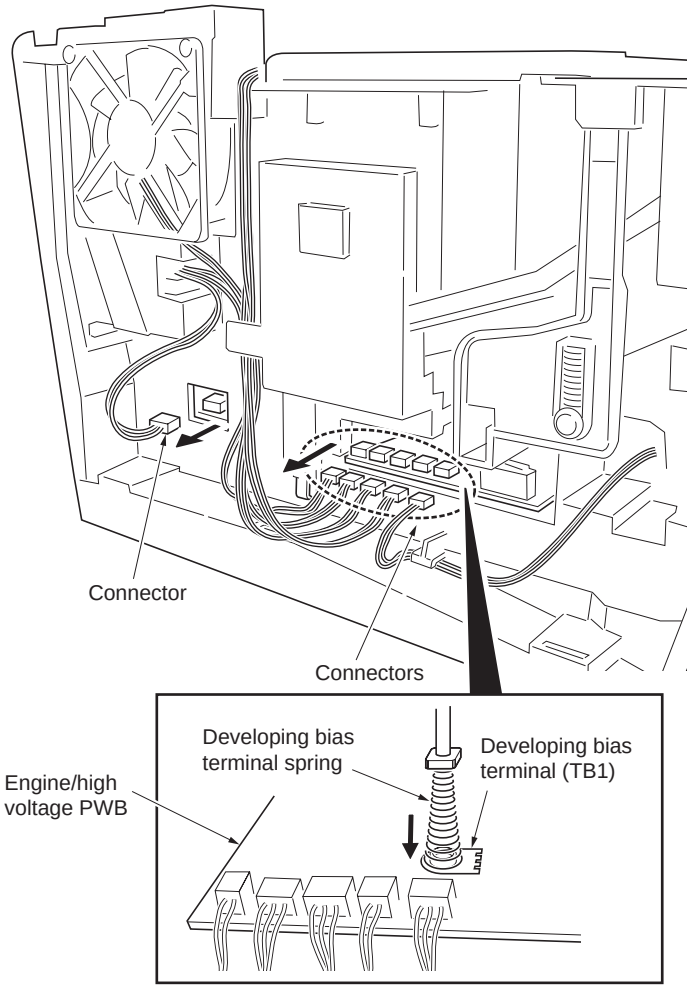


Figure 1-5-18

5. Turn the printer bottom side up.
6. Remove the five screws and then remove the bottom frame plate with PWBs (behind the plate).

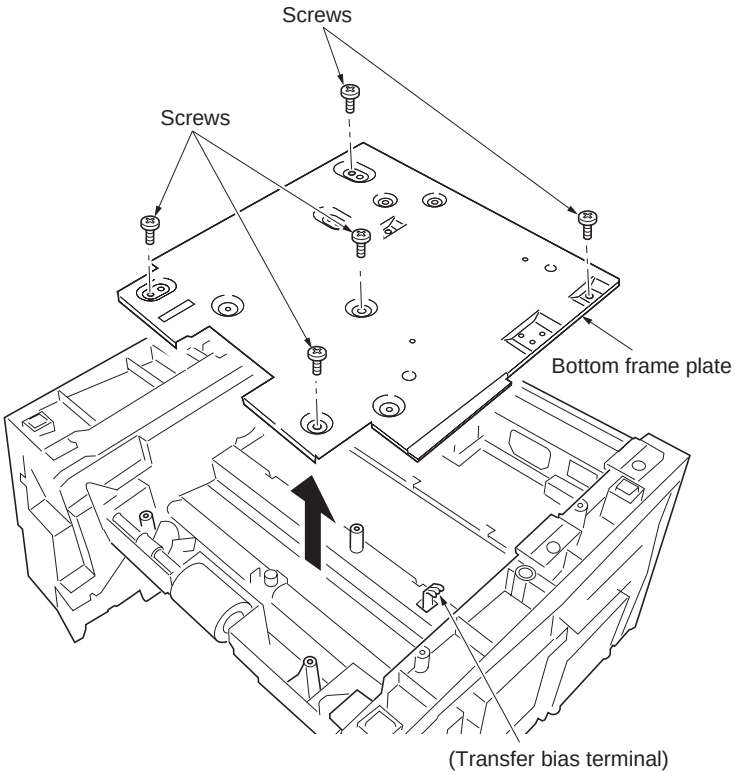


Figure 1-5-19

7. Remove the one screw and terminal from the bottom frame plate.
   * When securing the grounding terminal, hook the grounding wire to the projection.
8. Remove the two connectors from power source PWB.
9. Remove the three screws from power source PWB and power source fan motor.
10. Remove four screws from the engine/high voltage PWB.
11. Separate the engine/high voltage PWB and power source PWB.
12. Check or replace the engine/high voltage PWB or power source PWB and then refit all the removed parts.
    * To replace the engine/high voltage PWB, remove the EEPROM (U2) from the old engine/high voltage PWB and mount it to the new engine/high voltage PWB.
13. Check or replace the power source PWB or engine/high voltage PWB and refit all the removed parts.

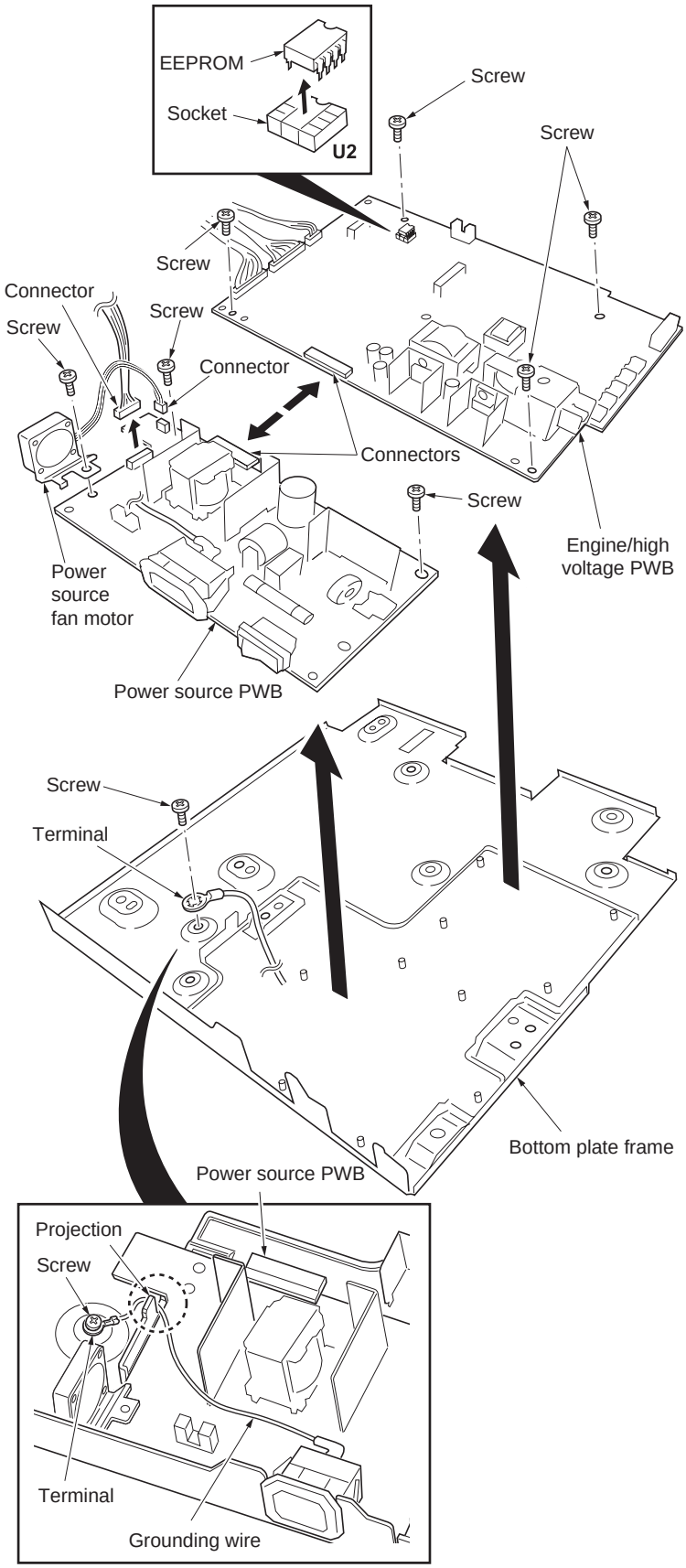


Figure 1-5-20

(4) Detaching and refitting the laser scanner unit

<Procedure>

1. Remove the outer covers (See page P.1-5-2).
2. Remove the two screws and then remove the LSU lid.

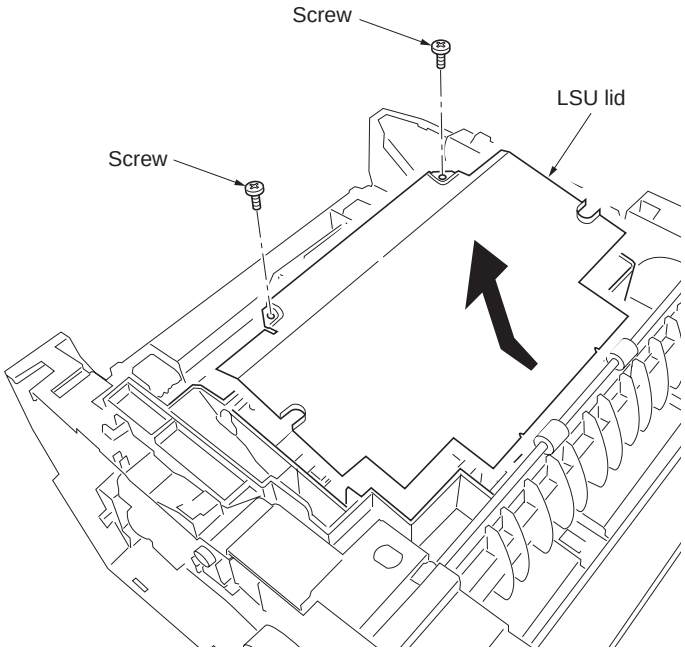


Figure 1-5-21

3. Remove the three screws.
4. Remove the two connectors and then remove the laser scanner unit.
5. Check or replace the laser scanner unit and refit all the removed parts.

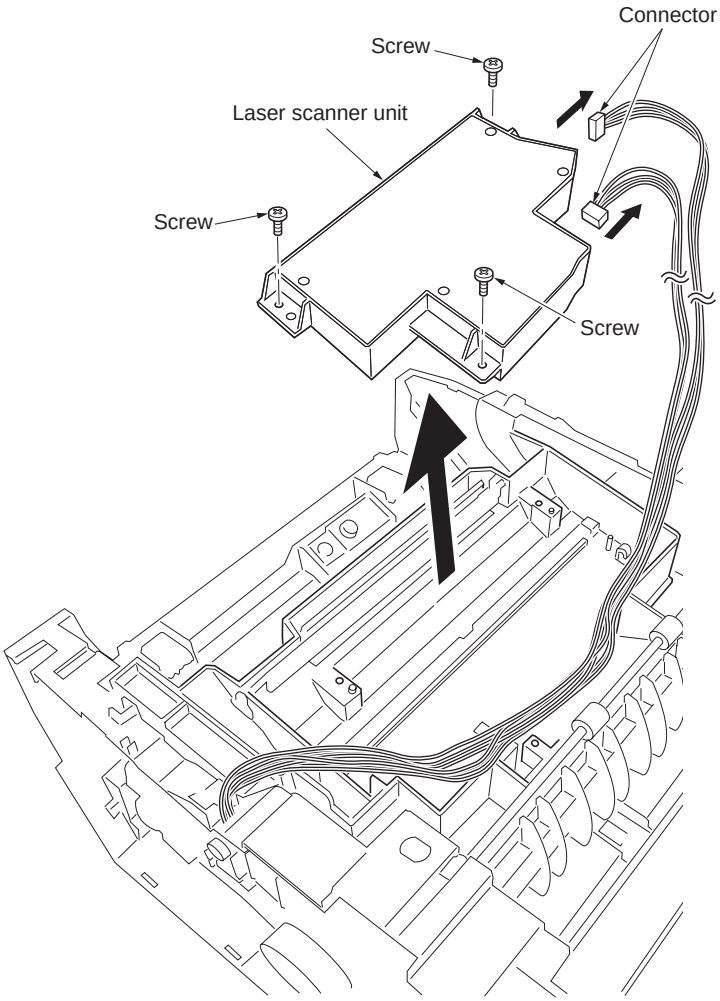


Figure 1-5-22

(5) Detaching and refitting the eraser lamp (PWB)

<Procedure>

1. Remove the laser scanner unit (See page P.1-5-17).
2. Remove the one connector.
3. Remove the wire from two clamps.

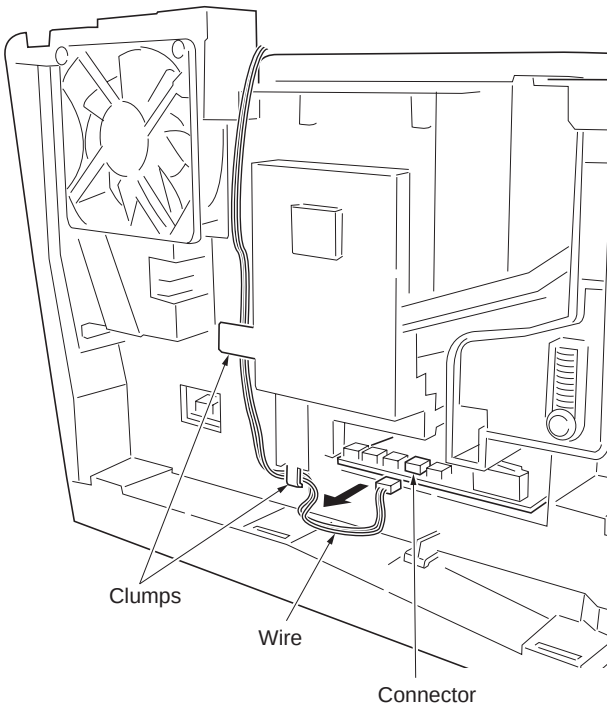


Figure 1-5-23

4. Remove the wire form clamp.
5. Remove the sheet eraser.
6. Remove the eraser lamp (PWB).
7. Check or replace the eraser lamp (PWB) and refit all the removed parts.

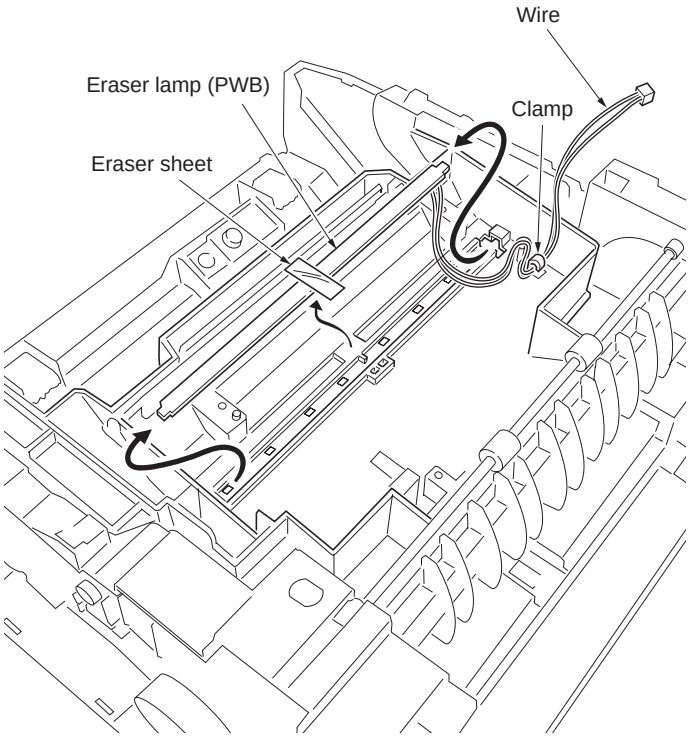


Figure 1-5-24

(6) Detaching and refitting the drive unit

<Procedure>

1. Remove the right cover (See page P.1-5-2).
2. Remove the three connectors.
3. Remove the two screws and then remove the two grounding plates.
4. Remove the two stoppers and then remove the two clutches.

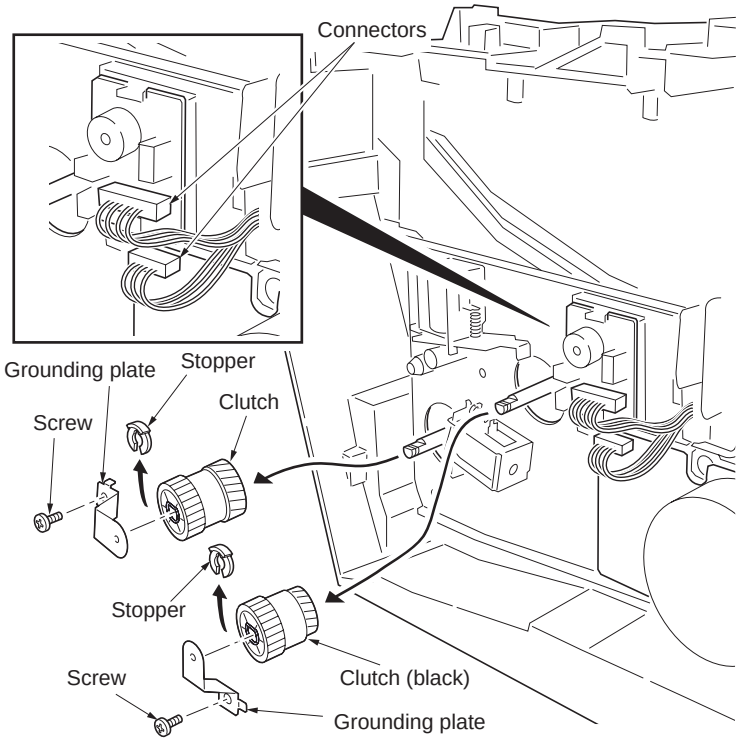


Figure 1-5-25

5. Remove the three screws and then remove the drive unit.
6. Check or replace the drive unit and refit all the removed parts.

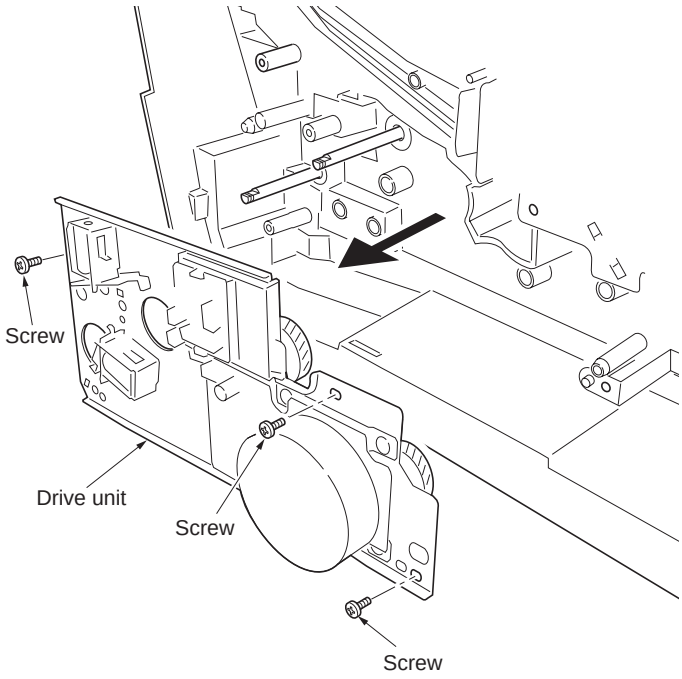


Figure 1-5-26

(7) Detaching and refitting the main motor

<Procedure>

1. Remove the right cover (See page P.1-5-24).
2. Remove the one connector from main motor.
3. Remove the four screws and then remove the main motor.
4. Check or replace the main motor and refit all the removed parts.

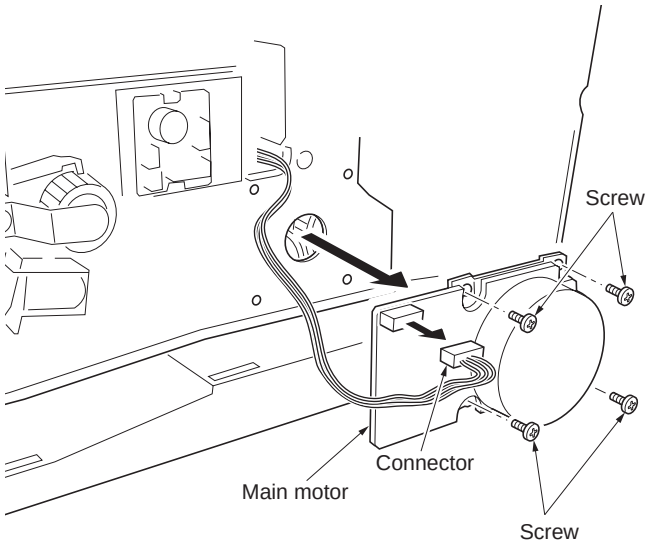


Figure 1-5-27

1-5-6 Scanner unit

(1) Detaching and refitting the scanner unit

<Procedure>

1. Remove the right cover and left cover (See page P.1-5-2).
2. Open the scanner unit.
3. While pressing the locks and then remove the lift link L and lift link R.

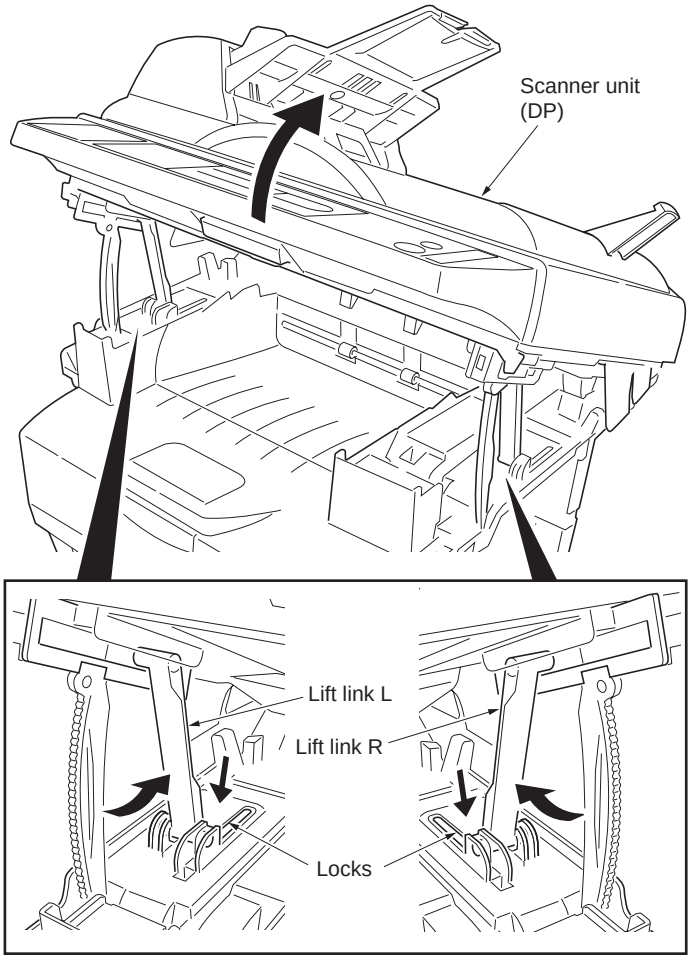


Figure 1-5-28

4. Remove the two screws and then remove the two terminals.
5. Remove the three connectors.
6. Remove the ferrite core.
7. Remove the two pivot pins.
8. Remove the scanner unit (with DP).
9. Check or replace the scanner unit and refit all the removed parts.

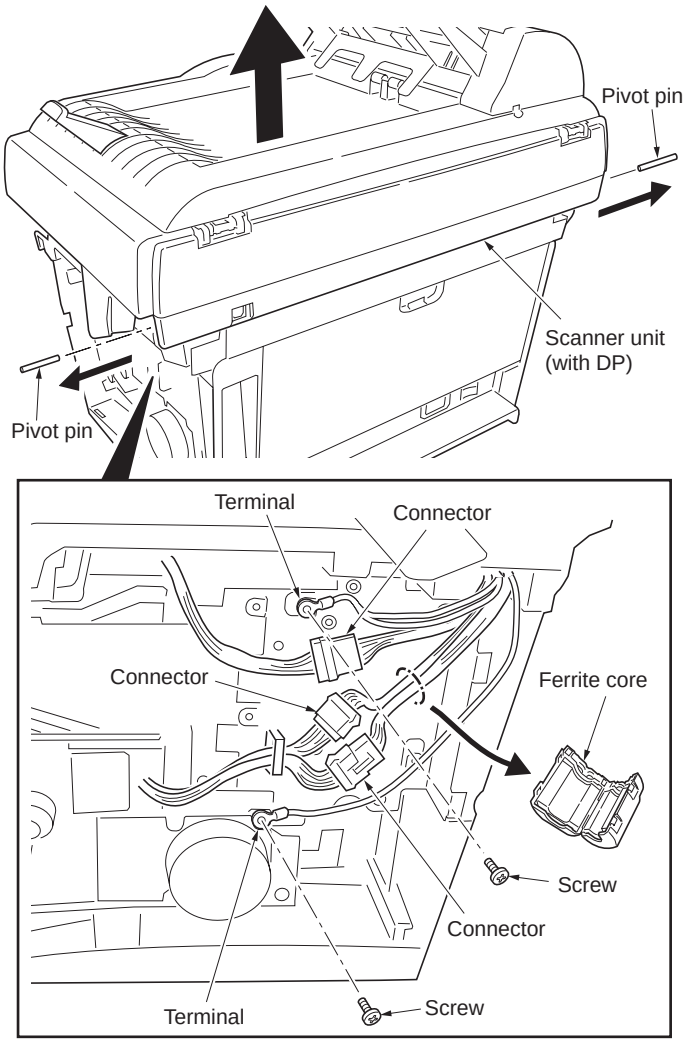


Figure 1-5-29

(2) Detaching and refitting the optical module unit

<Procedure>

1. Remove the scanner unit (See page P.1-5-22).
2. Unlatch the two latches and then remove the original table.
3. Remove the ejection extension.

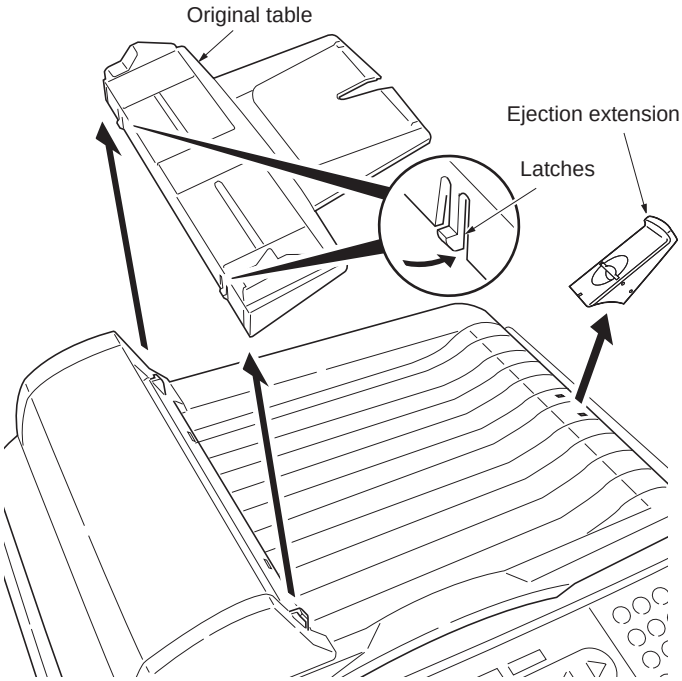


Figure 1-5-30

4. Turn over the scanner unit.
5. Remove the six screws and then open the main PWB cover.

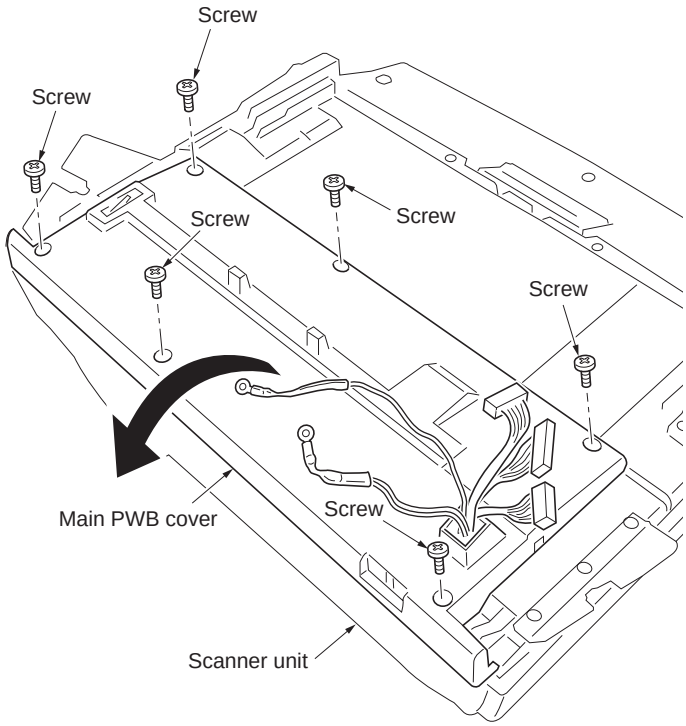


Figure 1-5-31

6. Remove the screw and then remove the terminal.
7. Remove the connector.
8. Cut the band.
9. Split and remove the ferrite core.

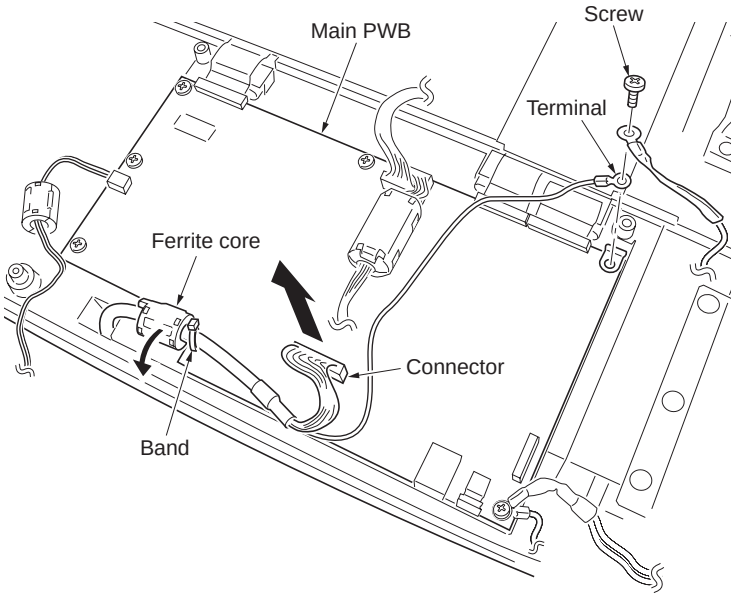


Figure 1-5-32

10. Remove the two screws and then remove the DP signal cable.
11. While pressing the hinge locks and then remove the hinges of DP.

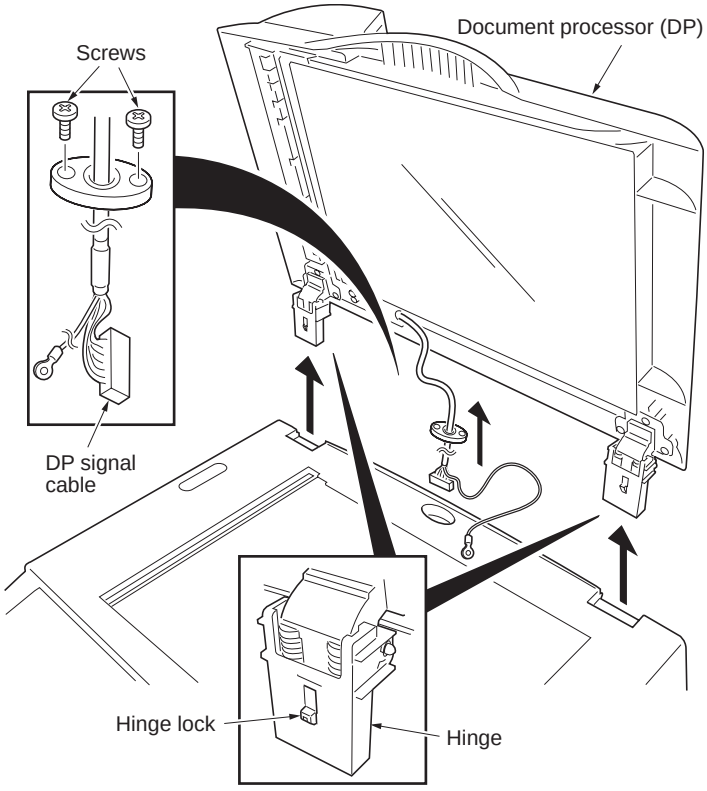


Figure 1-5-33

12. Remove the three screws.

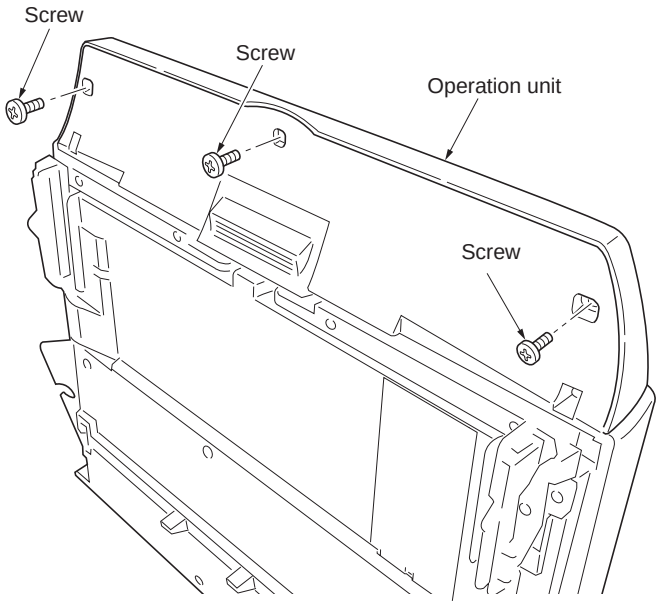


Figure 1-5-34

13. Remove the FFC form FFC connector.
14. Remove the operation unit.

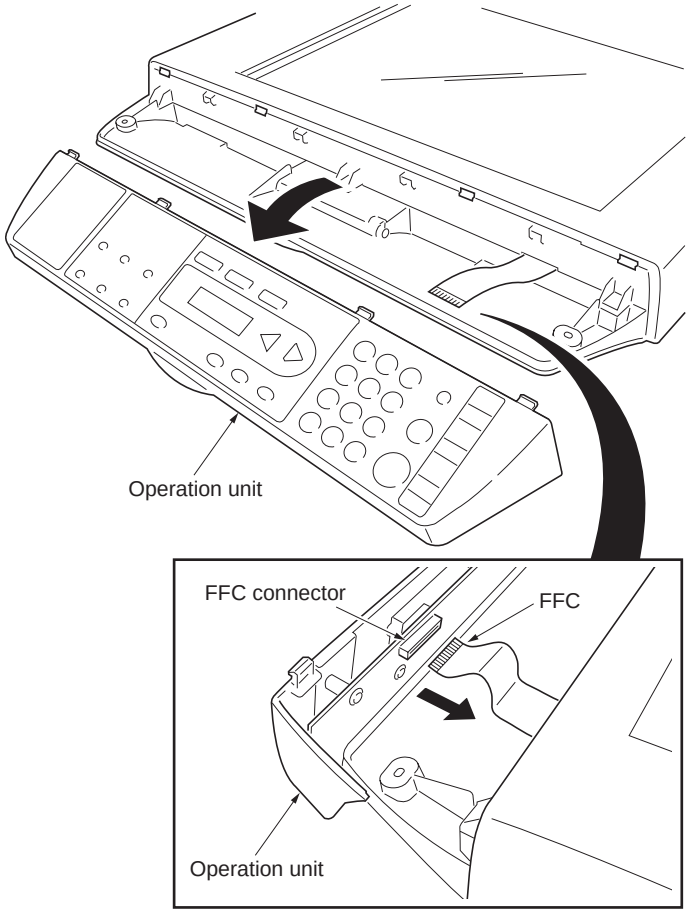


Figure 1-5-35

15. Remove the four screws and then remove the scanner upper housing.

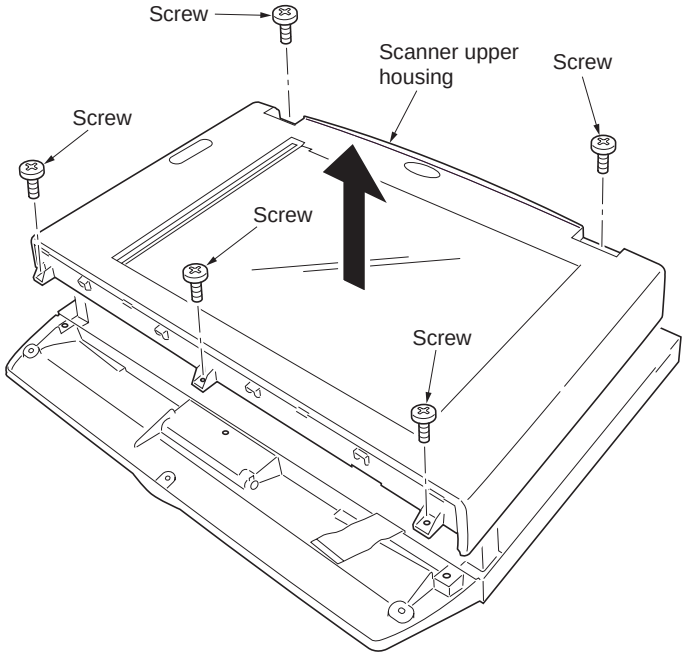


Figure 1-5-36

16. Remove the sliding rod.

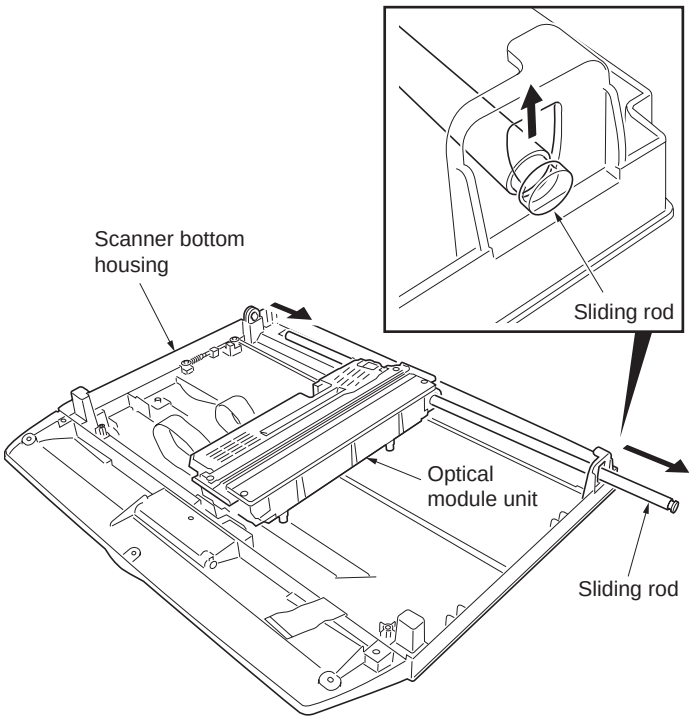


Figure 1-5-37

17. Remove the two FFCs.
18. Remove the optical module unit from the scanner belt.
19. Check or replace the optical module unit and refit all the removed parts.

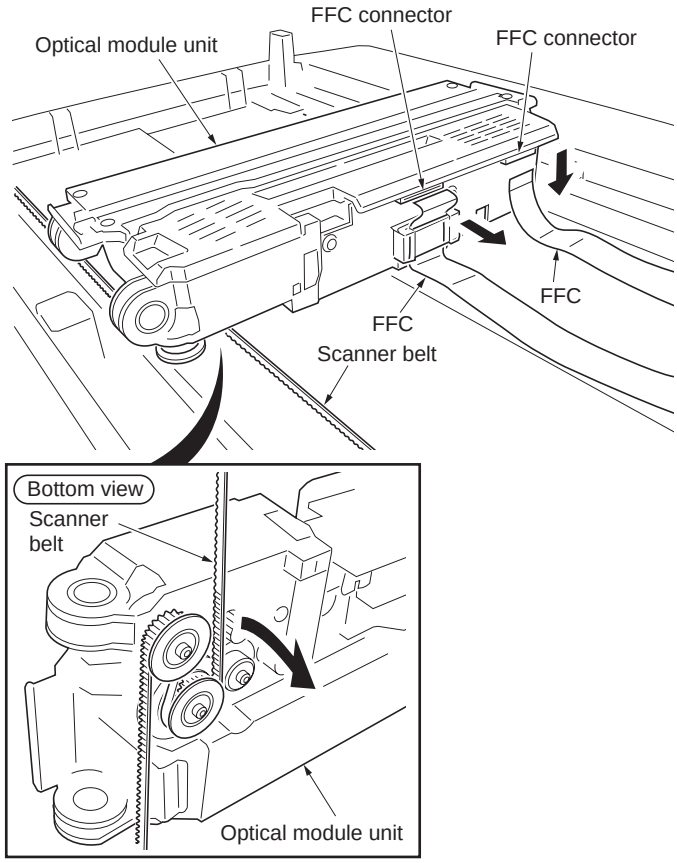


Figure 1-5-38

(3) Detaching and refitting the main PWB

<Procedure>

1. Remove the scanner unit (See page P.1-5-22).
2. Remove the original table and ejection extension (See page P.1-5-24).
3. Turn over the scanner unit.
4. Remove the six screws and then open the main PWB cover.

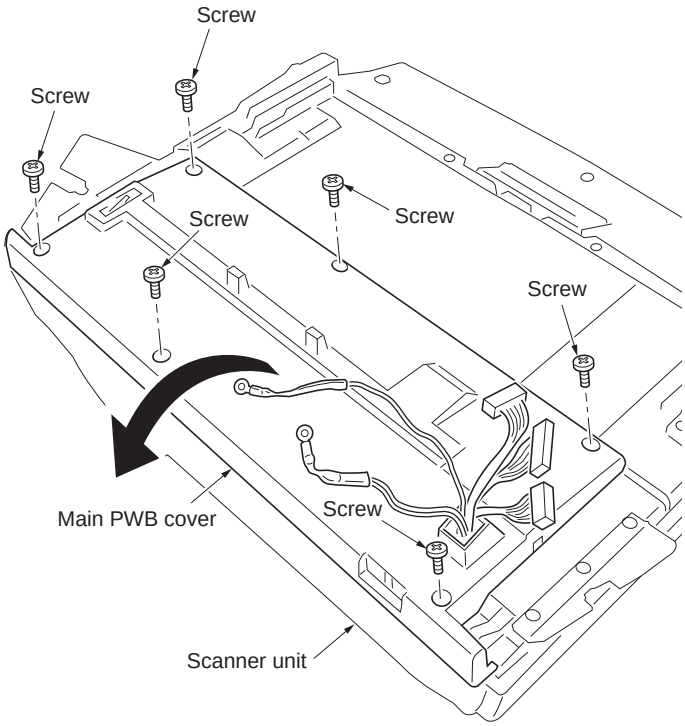


Figure 1-5-39

5. Remove the three FFCs.
6. Cut the band.
7. Split the ferrite core (B).
8. Remove the five connectors.

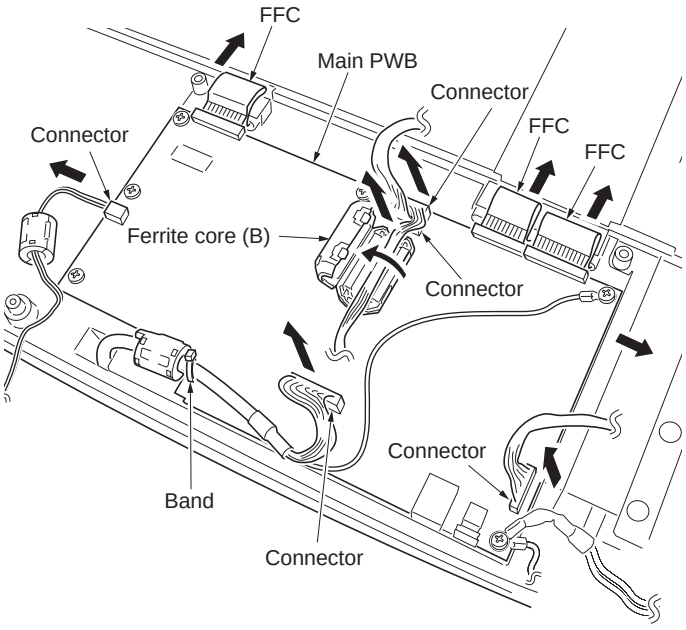


Figure 1-5-40

9. Remove the two screws (A) and then remove the three terminals.
10. Remove the four screws (B) and then remove the Main PWB.
11. Remove the lug terminal.

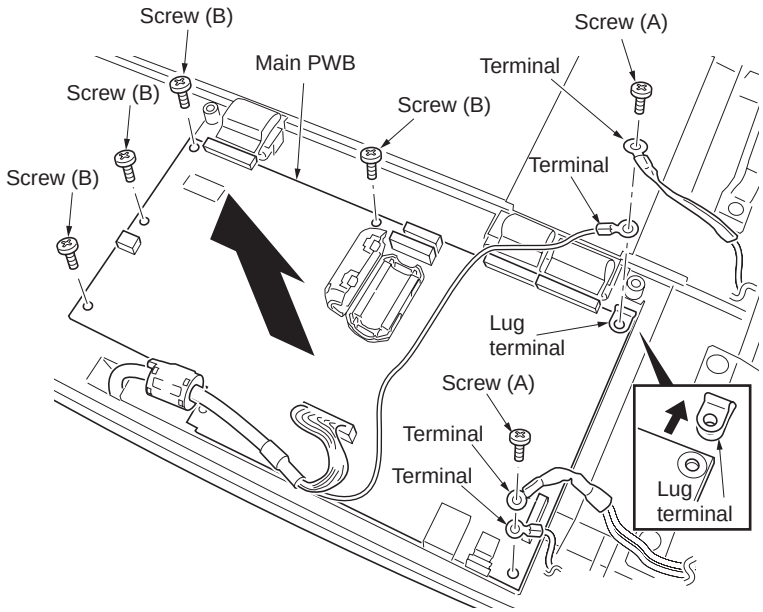


Figure 1-5-41

12. Check or replace the main PWB and refit all the removed parts.

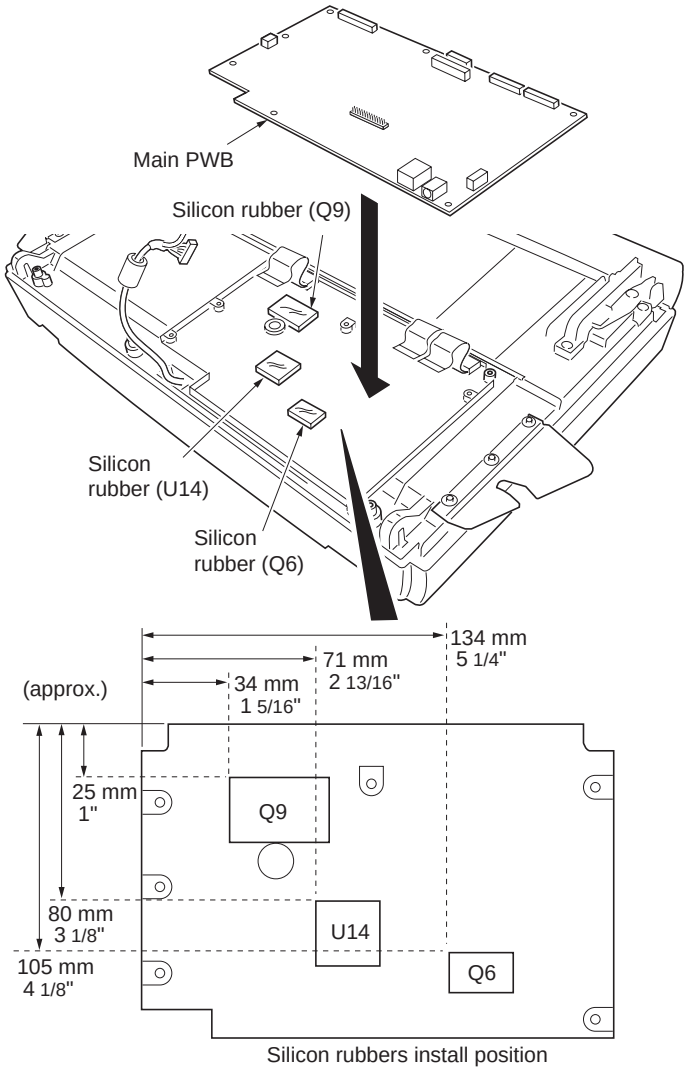


Figure 1-5-42

(4) Detaching and refitting the exposure lamp

<Procedure>

1. Remove the optical module unit (See page P.1-5-24).
2. Remove the CCD cover.

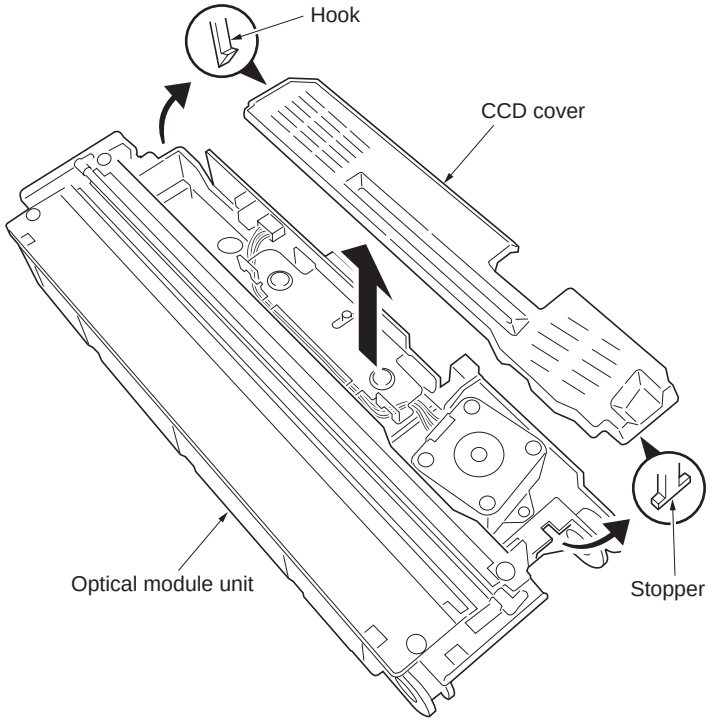


Figure 1-5-43

3. Remove the one connector.
4. Remove the adhesive tape.
5. Remove the exposure lamp holder.

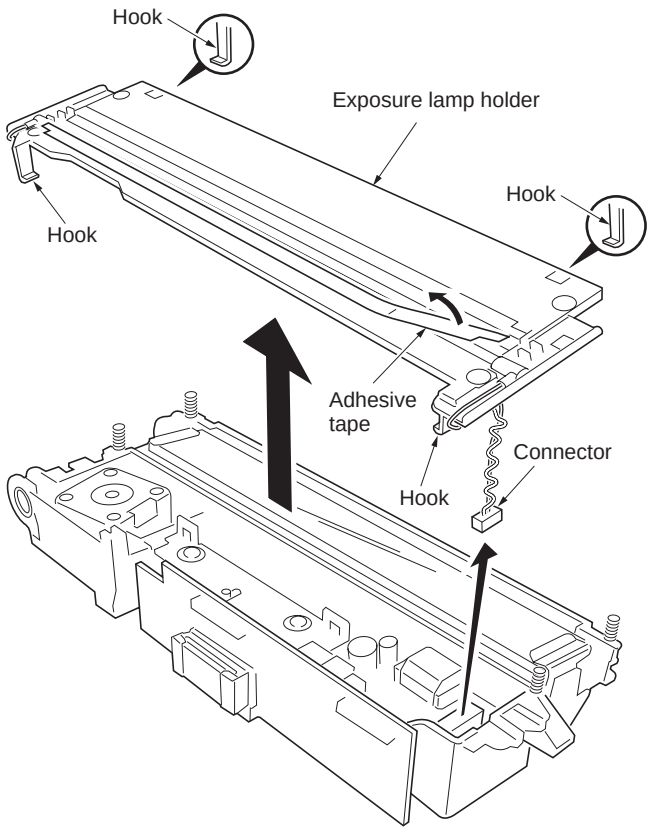


Figure 1-5-44

6. Remove the wires from the exposure lamp holder.
7. Remove the exposure lamp.
8. Check or replace the exposure lamp and refit all the removed parts.

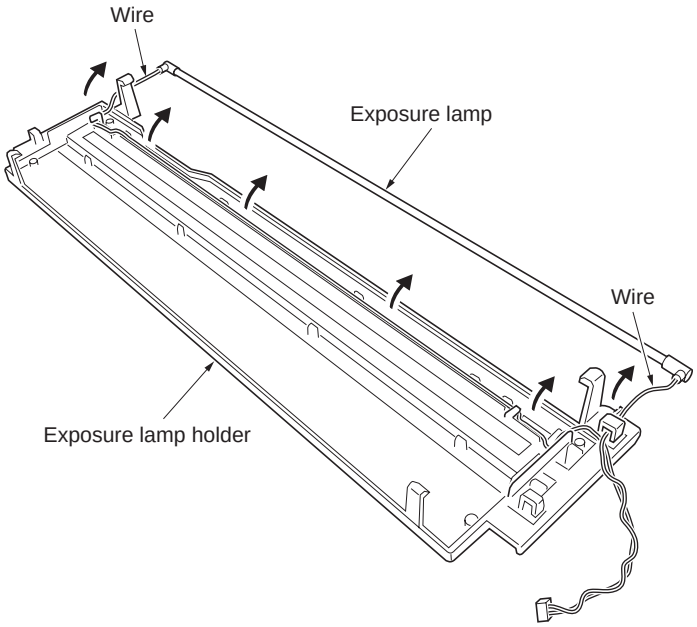


Figure 1-5-45

(5) Detaching and refitting the inverter PWB

<Procedure>

1. Remove the optical module unit (See page P.1-5-24).
2. Remove the CCD cover.

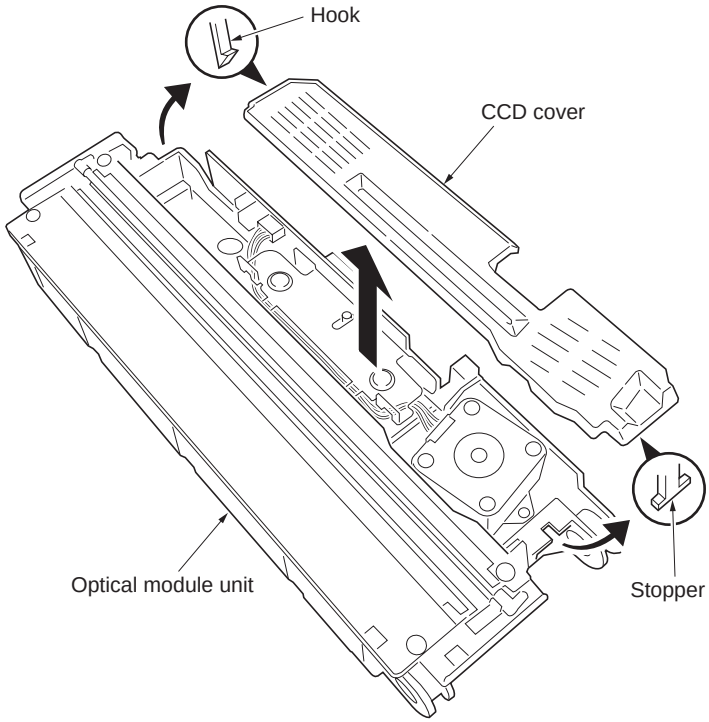


Figure 1-5-46

3. Remove the two connectors.
4. Remove the one screw and then remove the inverter PWB.
5. Check or replace the inverter PWB and refit all the removed parts.

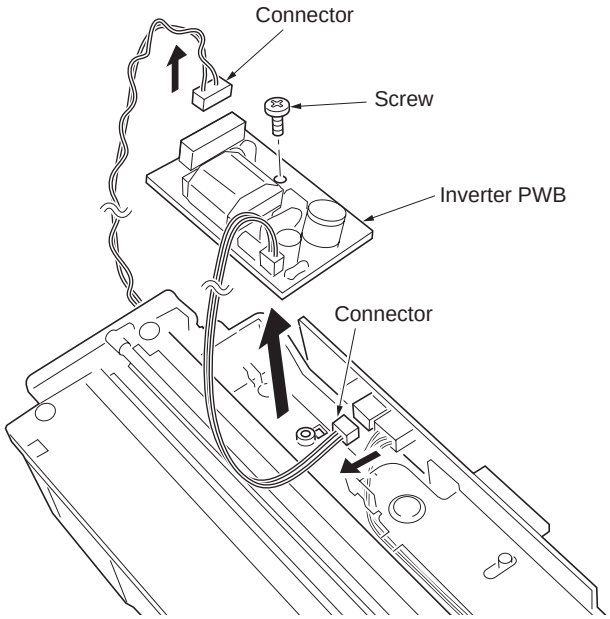


Figure 1-5-47

(6) Detaching and refitting the scanner home position sensor

<Procedure>

1. Remove the optical module unit (See page P.1-5-24).
2. Remove the CCD cover.

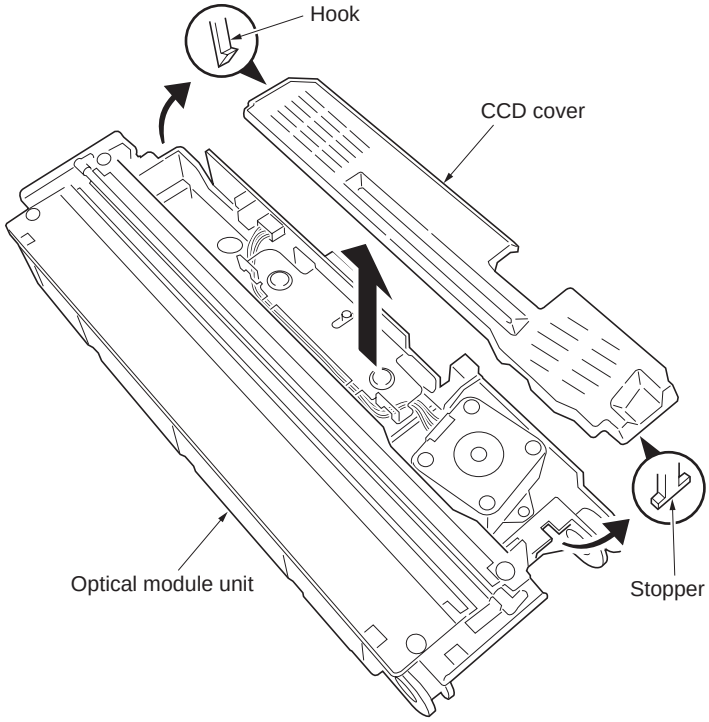


Figure 1-5-48

3. Remove the one connector.
4. Remove the one screw and then remove the scanner home position sensor.
5. Check or replace the scanner home position sensor and refit all the removed parts.

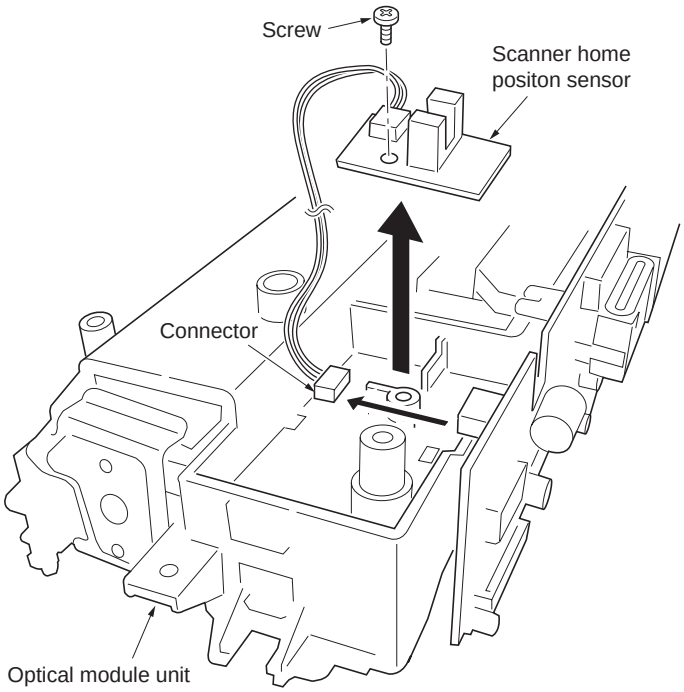


Figure 1-5-49

(7) Detaching and refitting the scanner motor

<Procedure>

1. Remove the optical module unit (See page P.1-5-24).
2. Remove the one connector.
3. Remove the scanner motor wire.

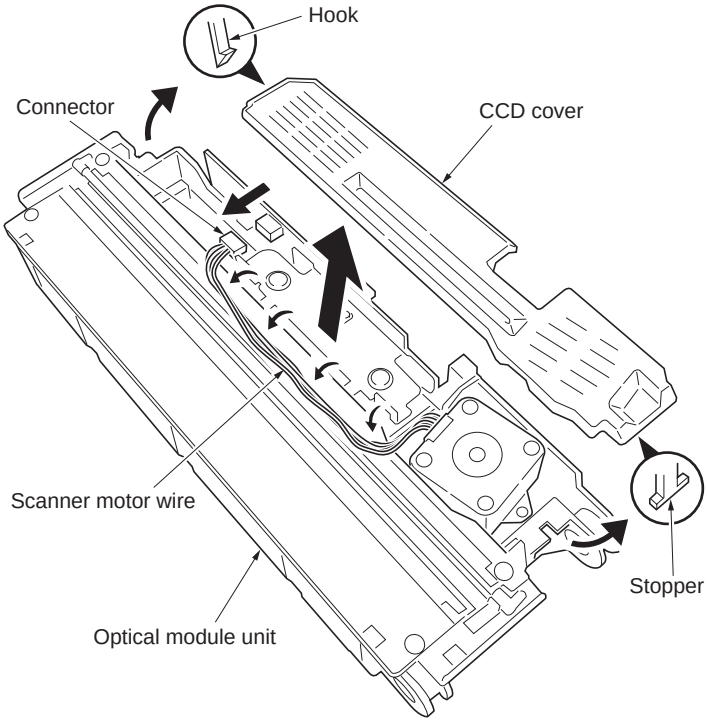


Figure 1-5-50

4. Remove the two screws.
5. Remove the scanner motor.
6. Check or replace the scanner motor and refit all the removed parts.

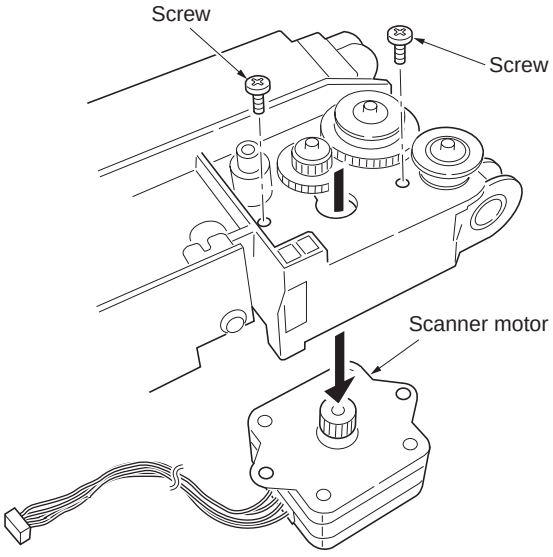


Figure 1-5-51

1-5-7 Document processor (DP)

(1) Detaching and refitting the document processor (DP)

<Procedure>

1. Remove the scanner unit (See page P.1-5-22).
2. Remove the original table and ejection extension (See page P.1-5-24).
3. Turn over the scanner unit.
4. Remove the six screws and then open the main PWB cover.

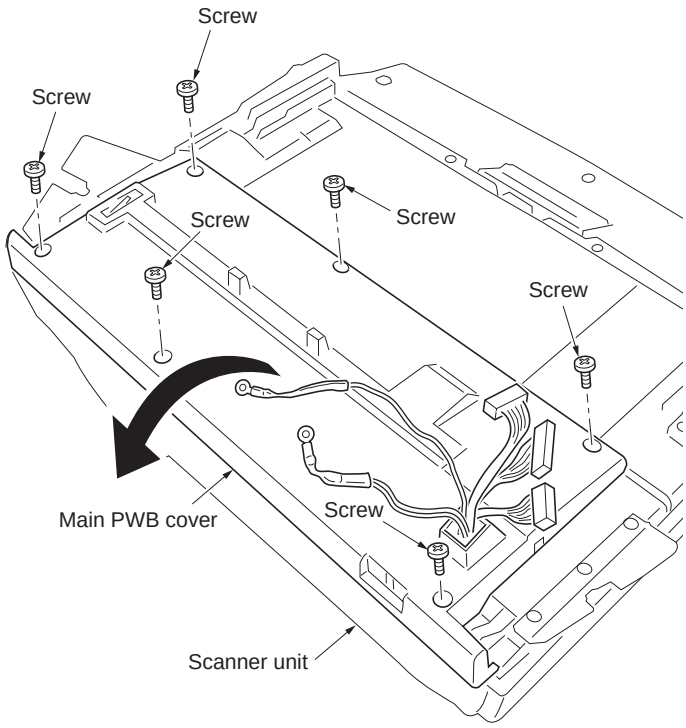


Figure 1-5-52

5. Remove the screw and then remove the terminal.
6. Remove the connector.
7. Cut the band.
8. Split and remove the ferrite core.

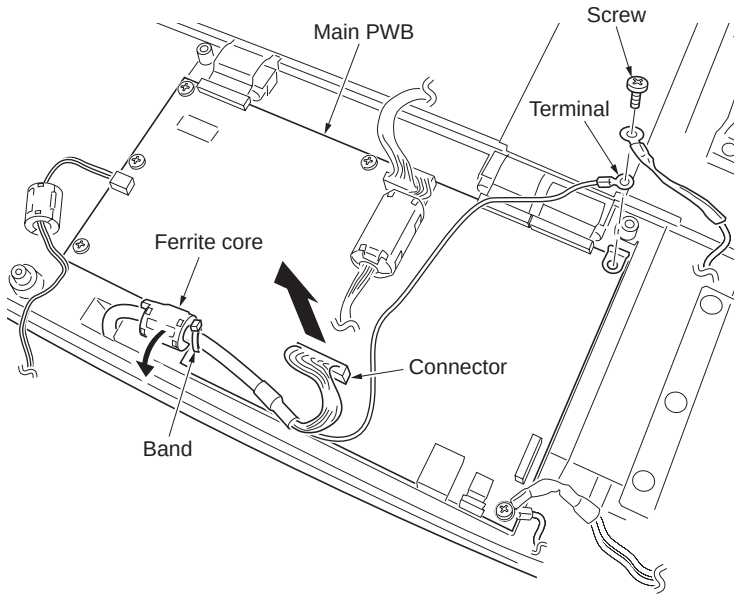


Figure 1-5-53

9. Remove the two screws and then remove the DP signal cable.
10. While unlocking the both hinge locks and then remove the document processor (DP).
11. Check or replace the document processor (DP) and refit all the removed parts.

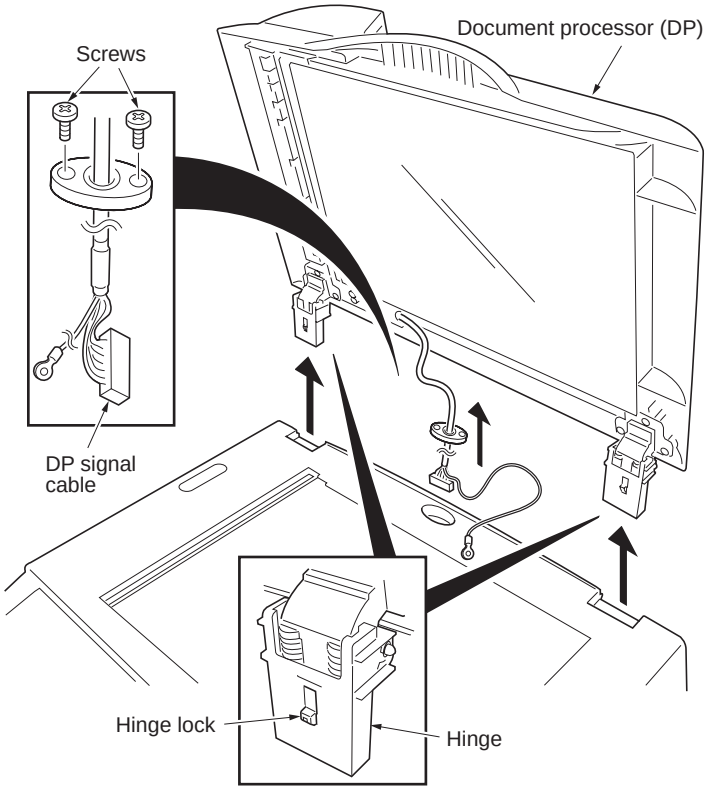


Figure 1-5-54

(2) Detaching and refitting the pad assembly

<Procedure>

1. Open the DP cover.
2. Press both arms of the pad assembly inwardly with your fingers and then pull out the pad assembly.
3. Check or replace the pad assembly and refit all the removed parts.

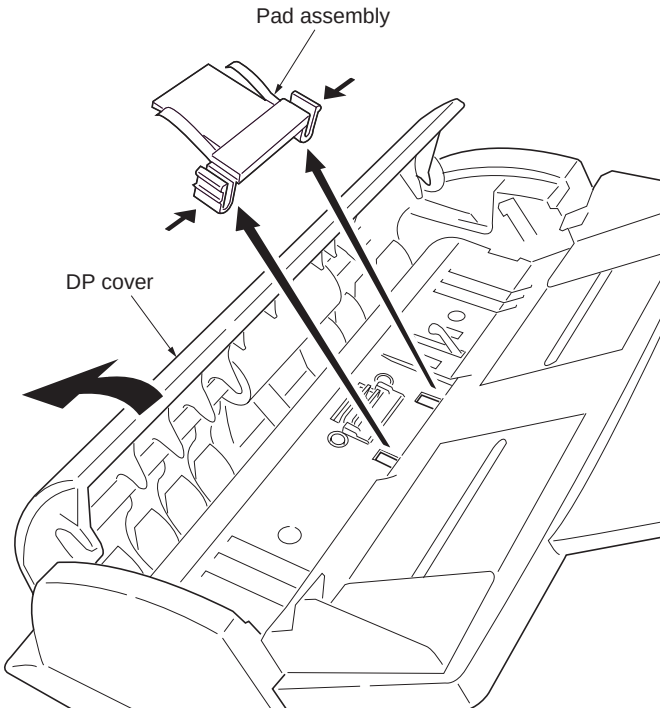


Figure 1-5-55

(3) Detaching and refitting the original feed roller

<Procedure>

1. Open the DP front cover.
2. Open the shaft holder.
3. Remove the original feed roller.
4. Check or replace the original feed roller and refit all the removed parts.

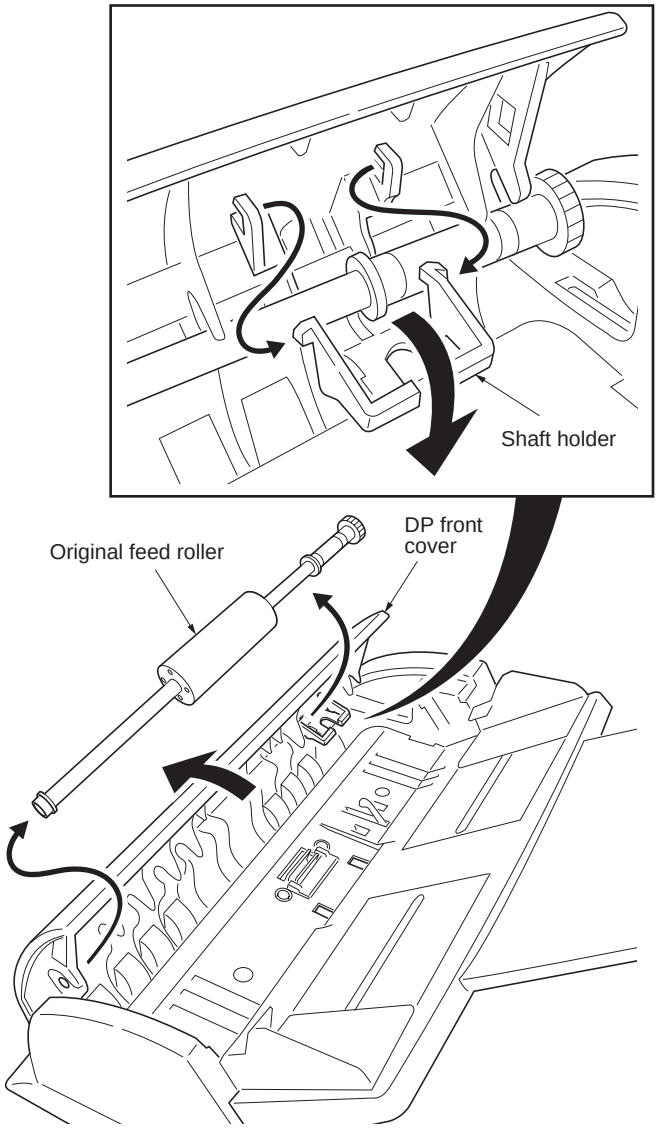


Figure 1-5-56

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1-6-1 Updating the firmware on the main PWB

Procedure

Note: Ensure the machine is plugged in and connected to the PC's USB port, install the updating firmware folder (files) before firmware updating.

1. Double-click [FWUpdate.exe] in the [Auto Update] updating firmware program folder. The updating firmware program starts automatically.

Updating firmware program folder

Example:

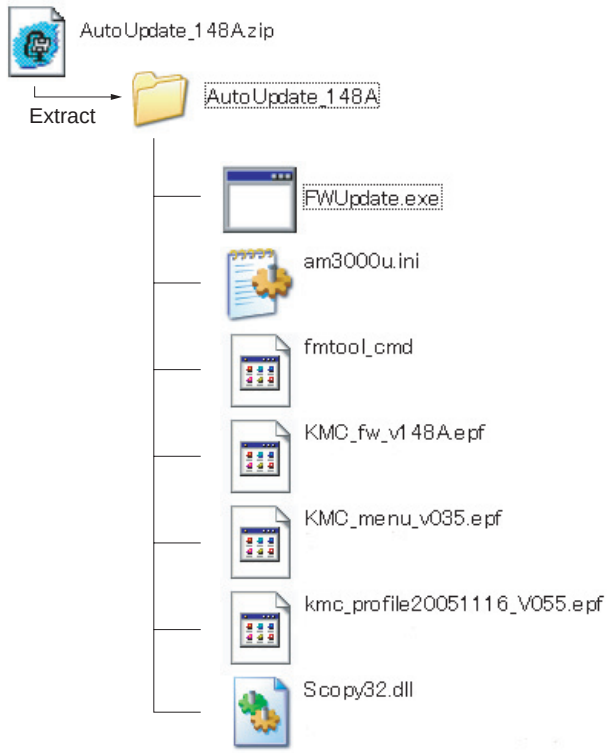

Figure 1-6-1

2. When message is displayed to indicate downloading is finished.
3. Turn printer power off and then turn on.

PC display

Message display

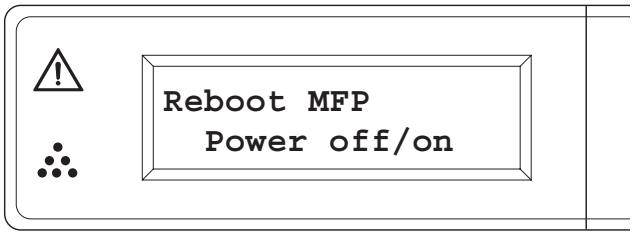

Figure 1-6-2

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2-1-1 Paper feeding/conveying section

The paper feeding/conveying system picks up paper from the paper cassette, manual feed tray, feeds it in the machine and delivers in the output tray. Paper is feed at the precise timing in synchronization with data processing.

(1) Paper feed section

The figure below shows the components in the paper feeding/conveying section and the paths through which the paper travels. The sensors, clutches, motor etc., are described in the following pages.

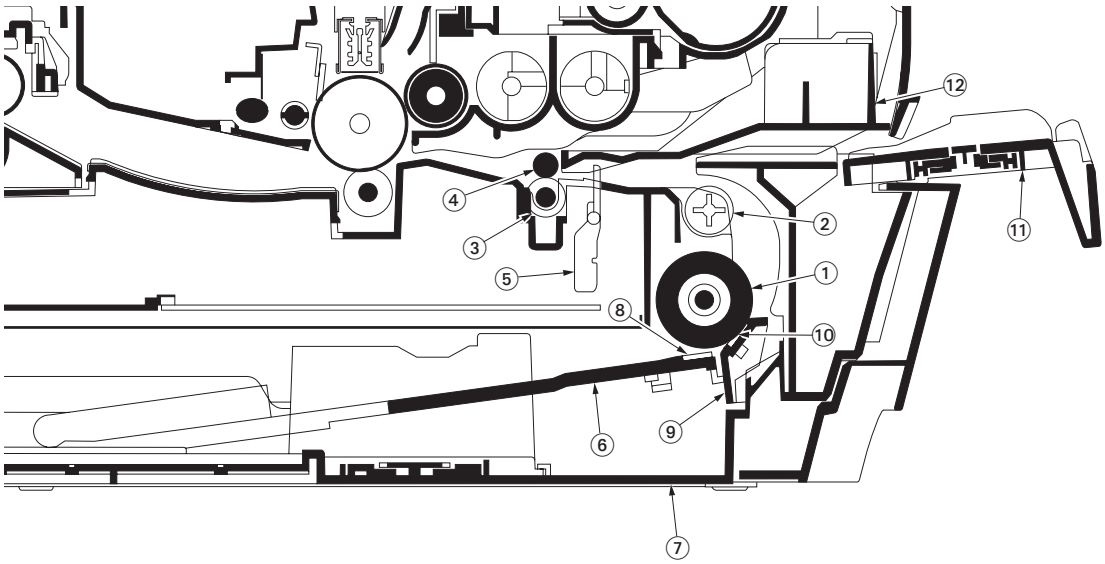

Figure 2-1-1 Paper feeding/conveying section

(1) Feed roller
(2) Feed pulley
(3) Lower registration roller
(4) Upper registration roller
(5) Registration sensor (Actuator)
(6) Base plate
(7) Cassette bottom
(8) Bottom pad
(9) Paper separator
(10) Separator pad
(11) Manual feed tray
(12) Feed guide

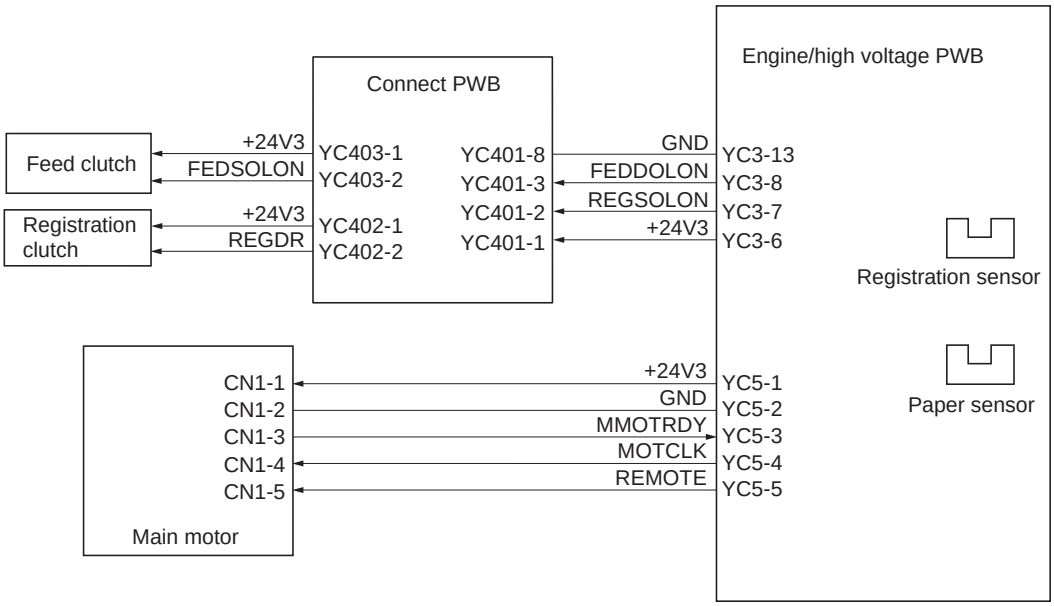

Figure 2-1-2 Paper feeding/conveying section block diagram

2-1-2 Drum section

(1) Drum unit

The durable layer of organic photoconductor (OPC) is coated over the aluminum cylinder base. The OPC tend to reduce its own electrical conductance when exposed to light. After a cyclic process of charging, exposure, and development, the electrostatic image is constituted over the OPC layer.
Since the OPC is materialized by resin, it is susceptible to damage caused by sharp edges such as a screwdriver, etc., resulting in a print quality problem. Also, finger prints can cause deterioration of the OPC layer, therefore, the drum (in the drum unit) must be handled with care. Substances like water, alcohol, organic solvent, etc., should be strictly avoided. As with all other OPC drums, the exposure to a strong light source for a prolonged period can cause a print quality problem. The limit is approximately 500 lux for less than five minutes. If the drum (drum unit) remains removed form the machine, it should be stored in a cool, dark place.
.

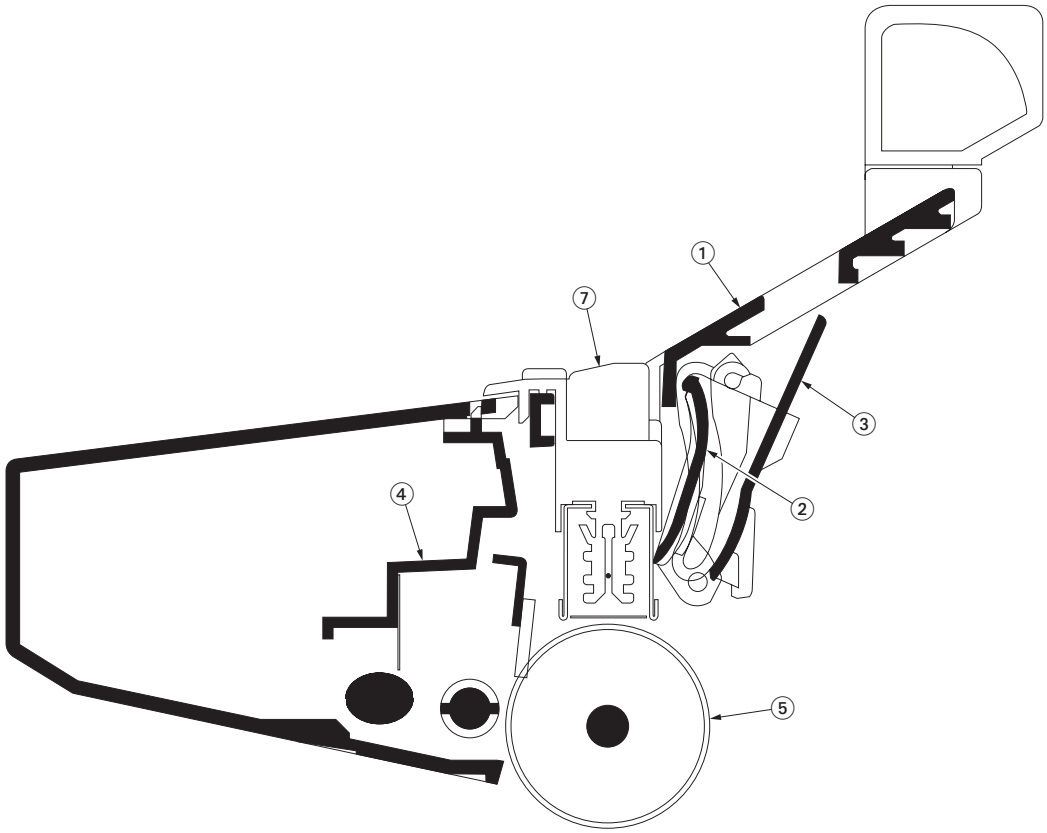

Figure 2-1-3 Drum unit

(1) Drum frame
(2) Drum cover A
(3) Drum cover B
(4) Waste toner cover
(5) Drum (OPC)

(2) Main charger unit

As the drum rotates in a “clean (neutral)” state, its photoconductive layer is given a uniform, positive (+) corona charge dispersed by the main charger wire. Due to high-voltage scorotron charging, the charging wire can get contaminated by oxidization after a long run. Cleaning the charging wire prevents print quality problems such as black streaks.

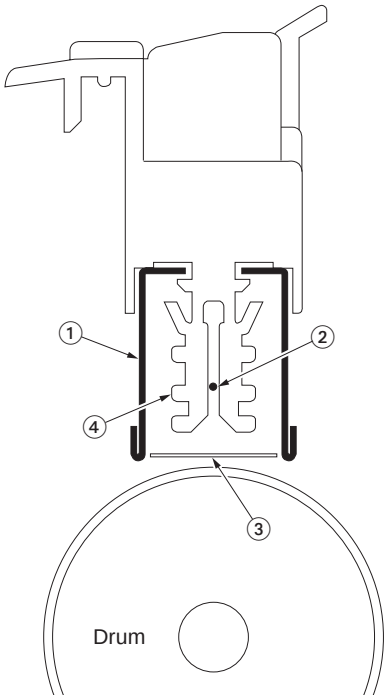

Figure 2-1-4Main charger unit

(1) Main charger shield
(2) Main charger wire
(3) Main charger grid
(4) Main charger wire cleaner

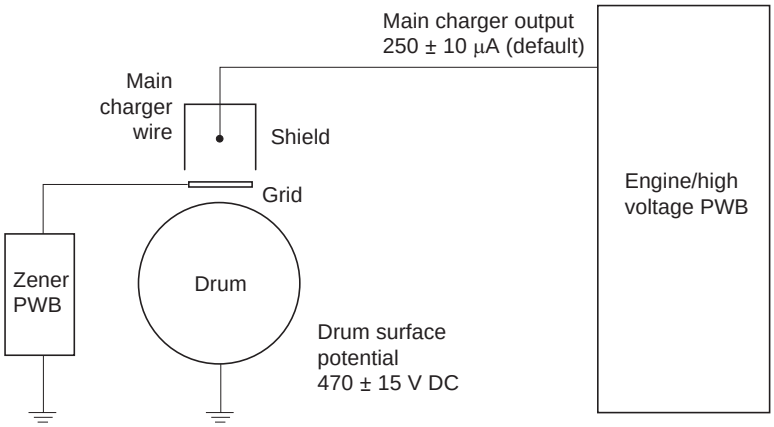

Figure 2-1-5Drum unit and main charger unit block diagram.

2-1-3 Expose section

(1) Laser scanner unit

The charged surface of the drum is then scanned by the laser beam from the laser scanner unit.
The laser beam (780 nm wavelength) beam is dispersed as the polygon motor revolves (27959 rpm) to reflect the laser beam over the drum. Various lenses and mirror are housed in the laser scanner unit, adjust the diameter of the laser beam, and focalize it at the drum surface.

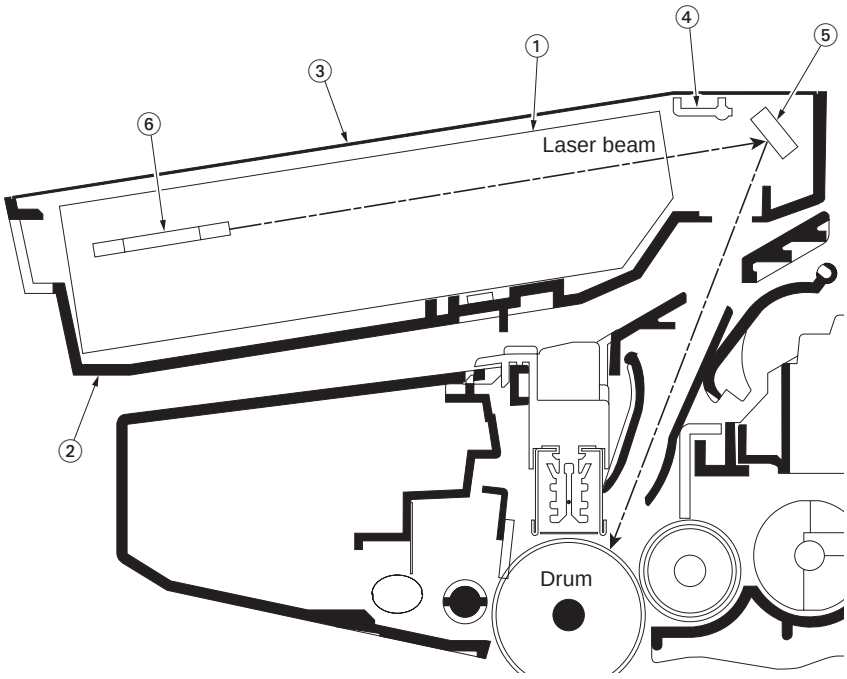

Figure 2-1-6Laser scanner unit

(1) Laser scanner unit
(2) MID frame
(3) LSU lid
(4) LSU shutter
(5) LSU mirror
(6) Polygon motor (mirror)

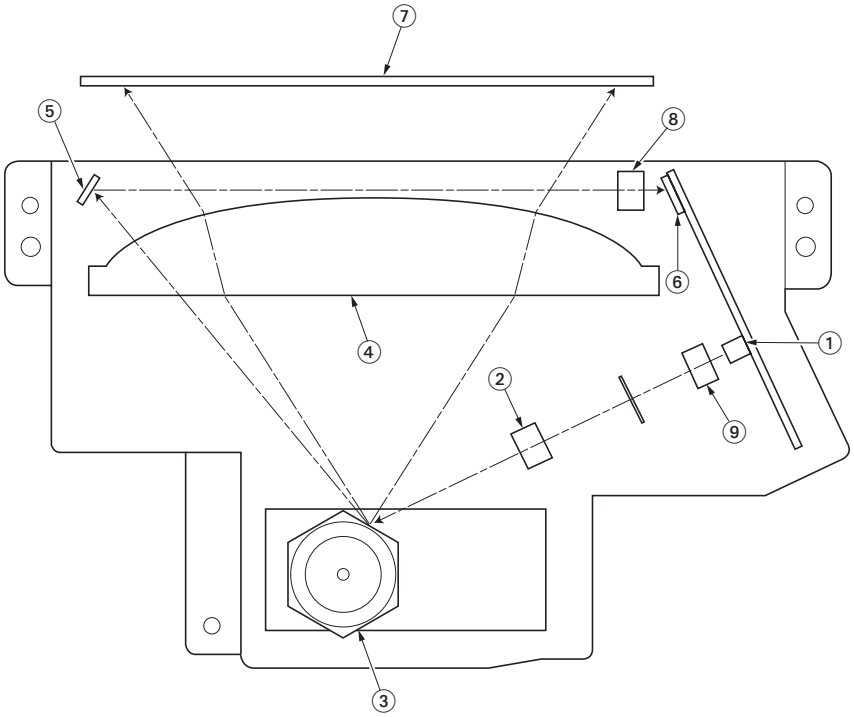

Figure 2-1-7Laser scanner unit

1. Laser diode ..... Emits diffused, visible laser.
2. Cylindrical lens ..... Compensates the vertical angle at which the laser beam hits a polygon mirror segment.
3. Polygon mirror (motor) ..... Has six mirror segments around its hexagonal circumference; each mirror corresponding to one scanned line width on the drum when laser beam scans on it.
4. F-theta lens ..... The f-theta lens equalizes focusing distortion on the far ends of the drum.
5. Sensor mirror ..... Bends the very first shot of a laser scan towards the pin photo diode sensor (⑥)
6. Pin photo diode sensor ..... When shone by the sensor mirror above, this pin photo diode sensor generates a trigger signal for the engine controller to start activating the paper feeding system.
7. LSU mirror ..... Diverts the laser beam vertically onto the drum. Note the diffused laser beam finally pinpoints on the drum.
8. PD lens ..... Condensing laser beam focus to the pin photo diode sensor.
9. Collimator lens ..... Aligns the laser beam to the cylindrical lens.

2-1-4 Developing section

(1) Developer unit

The latent image constituted on the drum is developed into a visible image. The developing roller contains a 3-pole (S-N-S) magnet core and an aluminum cylinder rotating around the magnet core. Toner attracts to the developing roller since it is powdery ink made of black resin bound to iron particles. Doctor blade, magnetized by magnet, is positioned approximately 0.30 mm above the developing roller to constitute a smooth layer of toner in accordance with the roller revolution. The developing roller is applied with the AC-weighted, positive DC power source. Toner on the developing roller is given a positive charge. The positively charged toner is then attracted to the areas of the drum which was exposed to the laser light. (The gap between the drum and the developing roller is 0.32 mm.) The non-exposed areas of the drum repel the positively charged toner as these areas maintain the positive charge.
The developing roller is also AC-biased to ensure contrast in yielding by compensating the toner's attraction and repelling action during development.

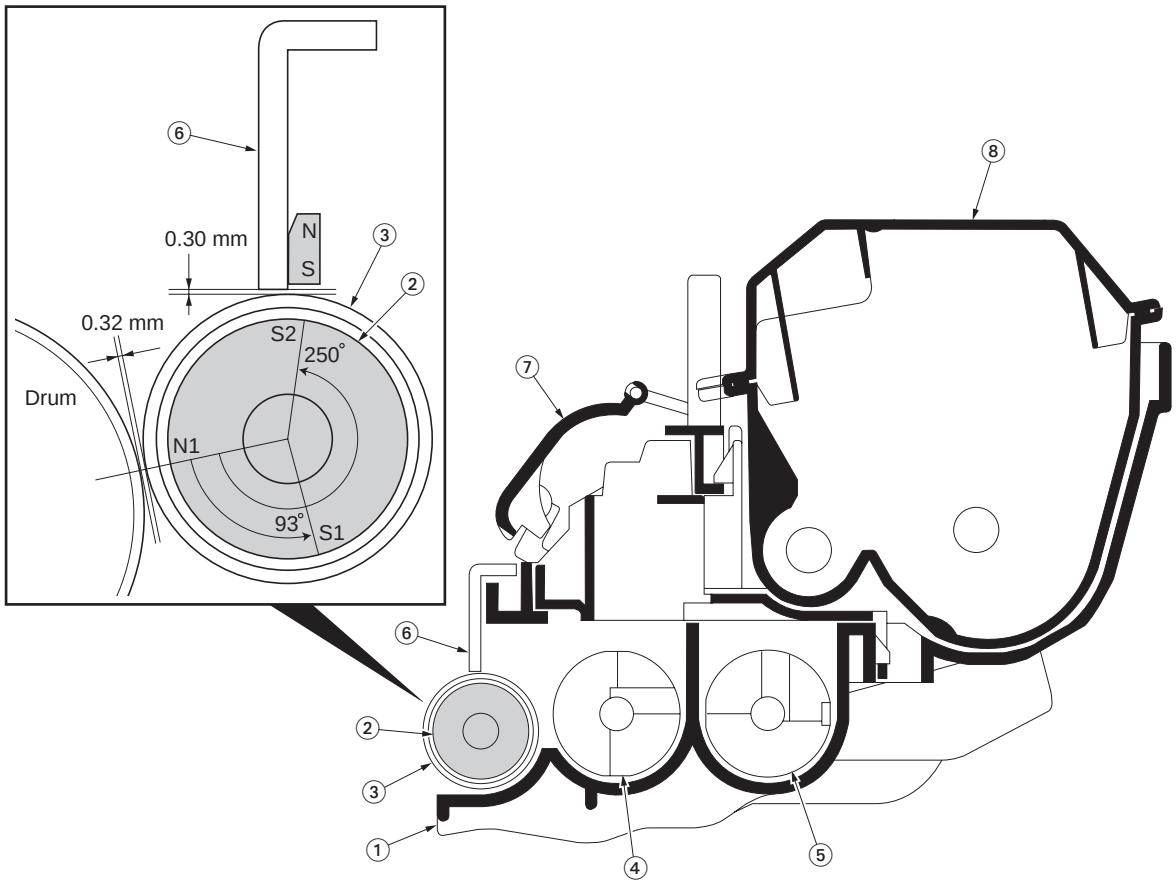

Figure 2-1-8Developer unit and toner container

(1)	DLP case	(5)	DLP screw B
(2)	Magnet roller	(6)	Doctor blade
(3)	Developing sleeve	(7)	DLP shutter
(4)	DLP screw A	(8)	Toner container

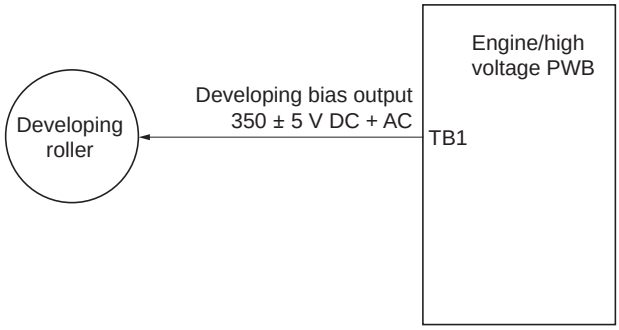

Figure 2-1-9Developing section block diagram

2-1-5 Transfer section

The image developed by toner on the drum is transferred onto the paper because of the electrical attraction between the toner itself and the transfer roller. The transfer roller is negatively biased so that the positively charged toner is attracted onto the paper while it is pinched by the drum and the transfer roller.

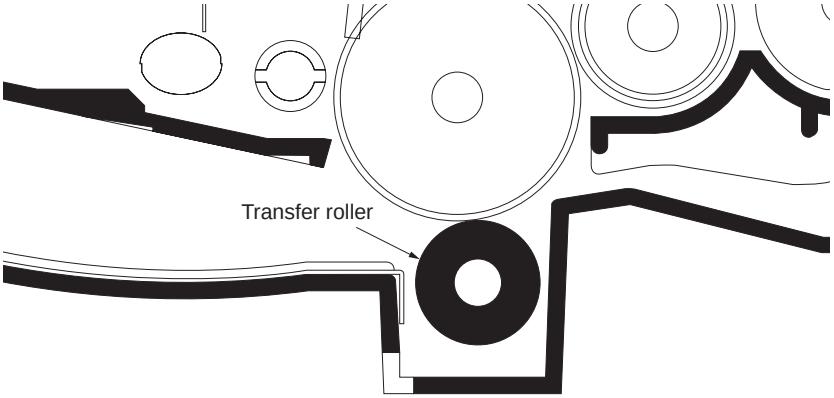

Figure 2-1-10Transfer section

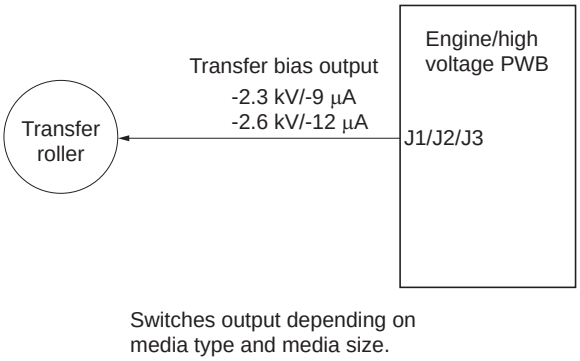

Figure 2-1-11Transfer section block diagram

2-1-6 Cleaning section

After the transferring process, the drum needs to be physically cleaned of toner which is residual after the development process. The cleaning blade is constantly pressed against the drum and scrapes the residual toner off to the sweep roller. The waste toner is collected at the output end of the sweep roller and sent back to the toner container, into the waste toner reservoir.
After the drum is physically cleaned, it then must be cleaned to the electrically neutral state. This is necessary to erase any residual positive charge, ready to accept the uniform charge for the next print process. The residual charge is canceled by exposing the drum to the light emitted from the eraser lamp (PWB). This lowers the electrical conductivity of the drum surface making the residual charge on the drum surface escape to the ground.

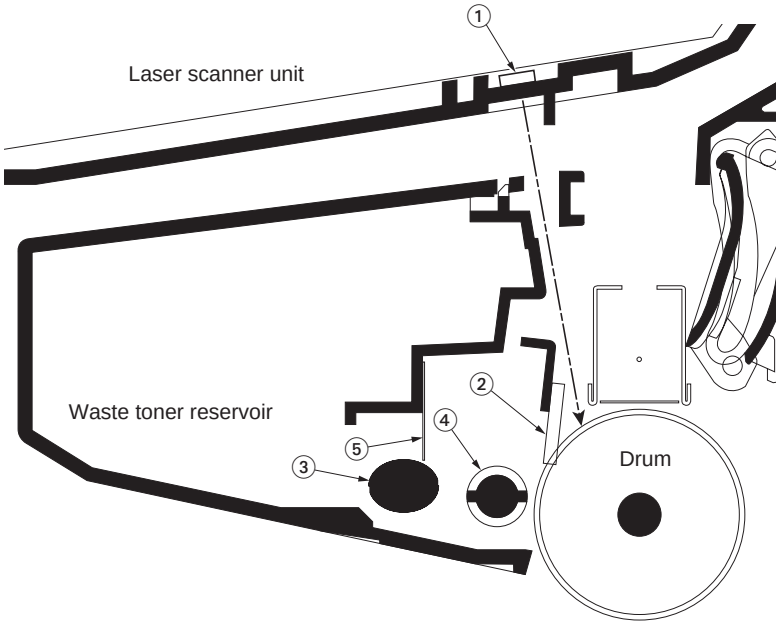

Figure 2-1-12Cleaning section

(1) Eraser lamp (PWB)
(2) Cleaning blade
(3) Sweep roller
(4) Drum roller
(5) Sheet sweep

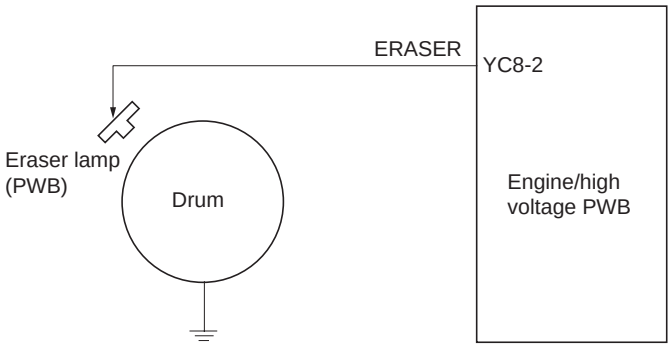

Figure 2-1-13Cleaning section block diagram

2-1-7 Fuser section

(1) Fuser unit

The toner on the paper is molten and pressed into the paper as it passes between the heat roller and the press roller in the fuser unit.
The heat roller has a heater lamp (750 W) inside which continuously turns on and off by the fuser thermistor to maintain the constant temperature onto the heat roller surface.
The heat roller is resin coated by florin to prevent toner from accumulating on the roller after a long run. Care must be taken while handling the heat roller not to scratch the roller surface as doing so may result in print problems.
The heat roller has four claws (separators) which are continuously in contact with its surface. These claws (separators) prevent the paper on which toner has been fused from being wound around the heat roller causing paper jam.
The press roller is made of the heat-resistant silicon rubber. This roller is used to strongly press the paper towards the heat roller by means of coil springs.
The temperature of the heat roller is constantly monitored by the engine/high voltage PWB using the fuser thermistor and triac. Should the temperature of the heat roller exceed the predetermined value, the thermal cutout is activated to effectively disconnect the heater lamp from power.

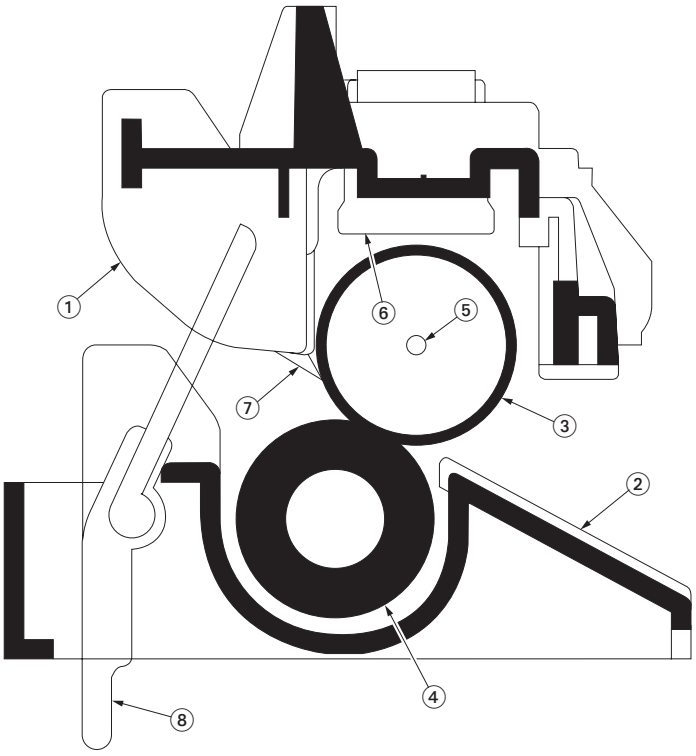

Figure 2-1-14Fuser unit

(1)	Upper fuser frame	(5)	Heater lamp
(2)	Lower fuser frame	(6)	Thermal cutout
(3)	Heat roller	(7)	Separators
(4)	Press roller	(8)	Fuser actuator

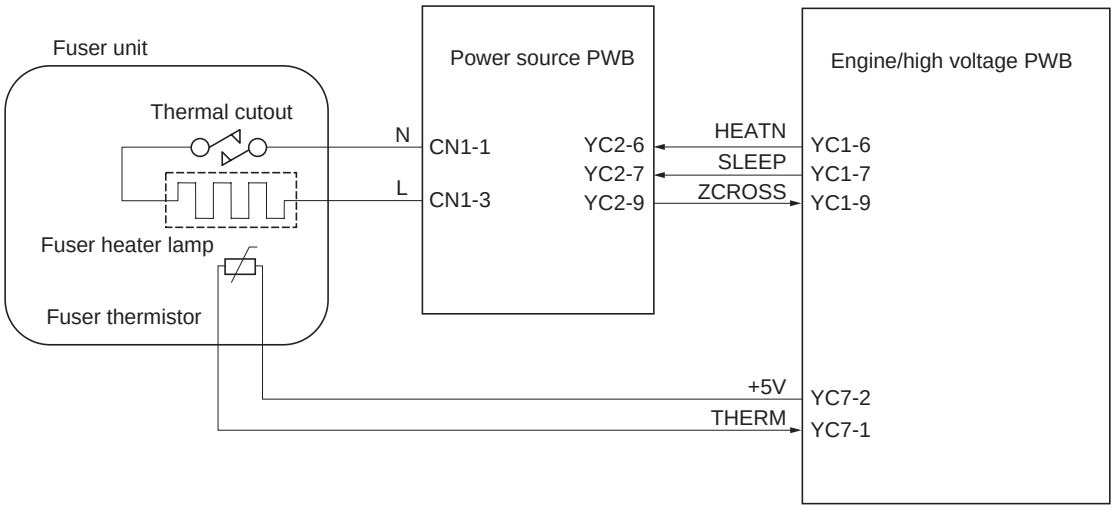

Figure 2-1-15Fuser section block diagram

2-1-8 Paper exit section

(1) Paper exit section

The paper exit section transports the paper which passed the fuser unit towards the output tray. The paper which passed through the fuser unit turns on the exit sensor which is driven by the fuser actuator in the fuser unit, and is led by the guide comprised of the rear cover and the frame, finally reaching the FD roller. The paper is delivered to the output tray by the rotation of the FD roller.

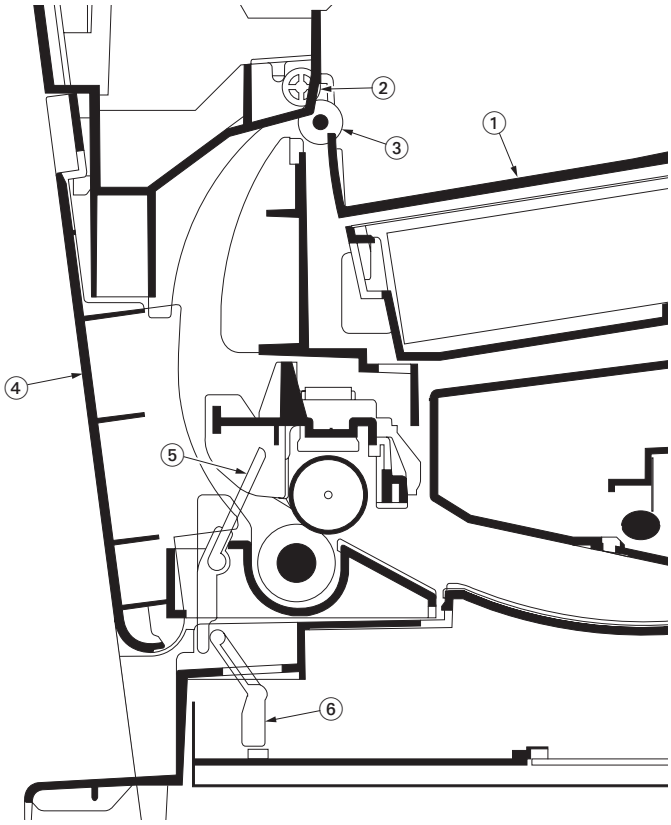

Figure 2-1-16Paper exit section

(1) Output tray
(2) FD pulley
(3) FD roller
(4) Rear cover
(5) Fuser actuator
(6) Exit sensor actuator

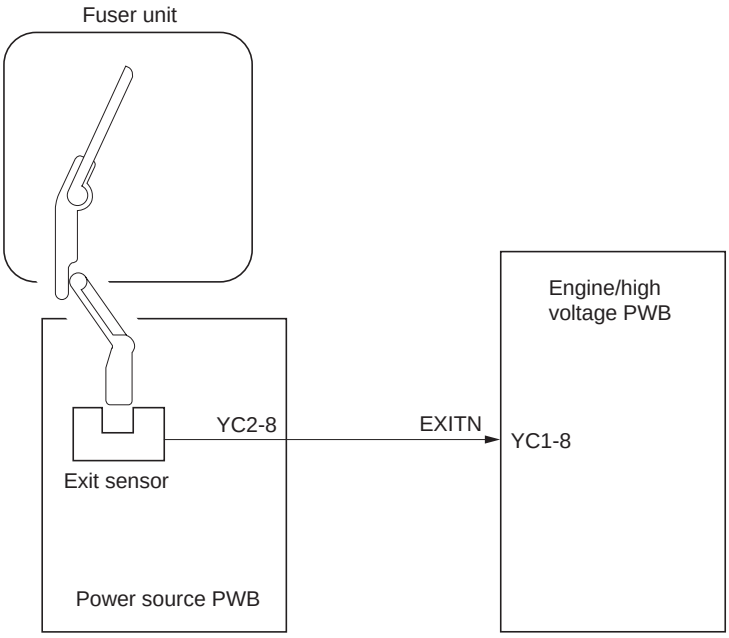

Figure 2-1-17Paper exit section block diagram

2-1-9 Scanner section

(1) Scanner unit

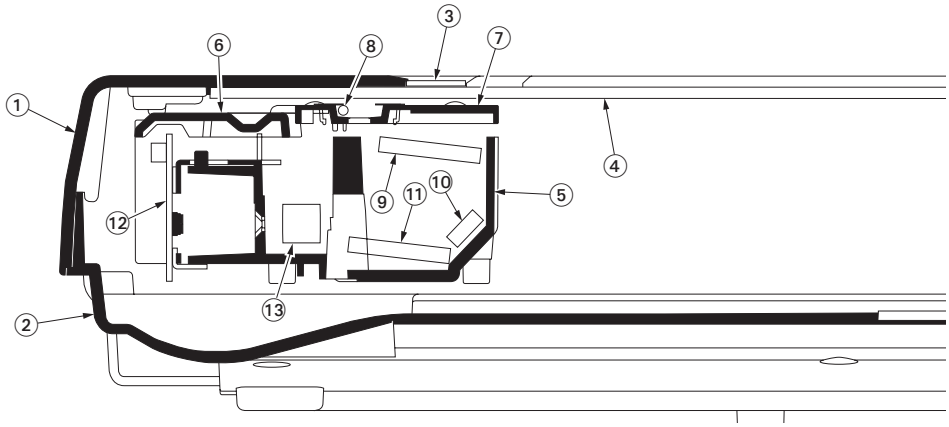

Figure 2-1-18Scanner section

(1) Scanner upper housing
(2) Scanner bottom housing
(3) Contact glass
(4) Size indicator
(5) Optical module unit housing
(6) Lamp housing
(7) CCD cover
(8) Exposure lamp
(9) Mirror
(10) Mirror
(11) Mirror
(12) Lens
(13) CCD PWB

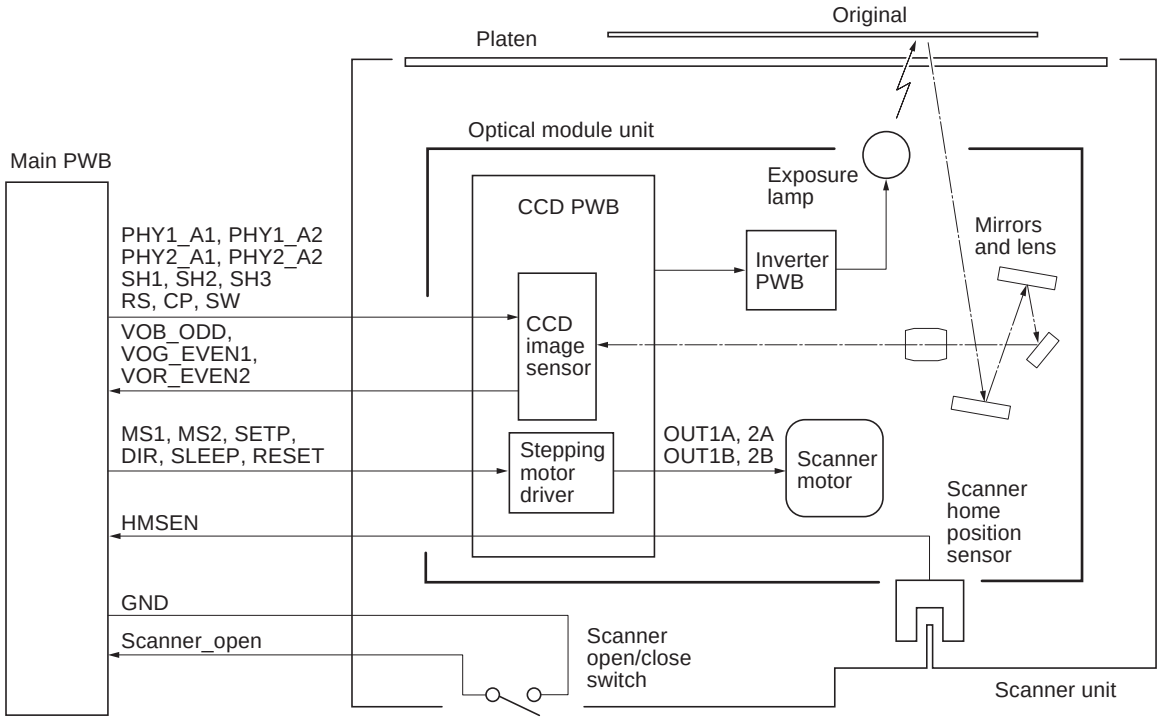

Figure 2-1-19Scanner section block diagram

(2) Optical module unit

The optical module unit consists of an exposure lamp, three mirrors, a lens, a CCD PWB, and so on. Also an inverter PWB for driving the exposure lamp and a scanner home position sensor for detecting the home position of the optical module unit are incorporated.
The original on the contact glass is exposed to the light of the exposure lamp that is reflected by the reflector. The image is input through reflection by the three mirrors and through the lens to the CCD image sensor on the CCD PWB. The CCD image sensor scans one row of the image in the main scan direction, converts it to electric signals, and outputs them to the main PWB. Then the optical module unit is moved in the sub scan direction along the sliding rod, and the CCD image sensor scans the next row of the image in the main scan direction. The operation described above is repeated for scanning the overall image of the original. If a document processor (DP) is used, the optical module unit stops at the position of the contact glass and scans sequentially one row of the image on the original in synchronization with the moving timing of the original in the sub scan direction by driving the DP.

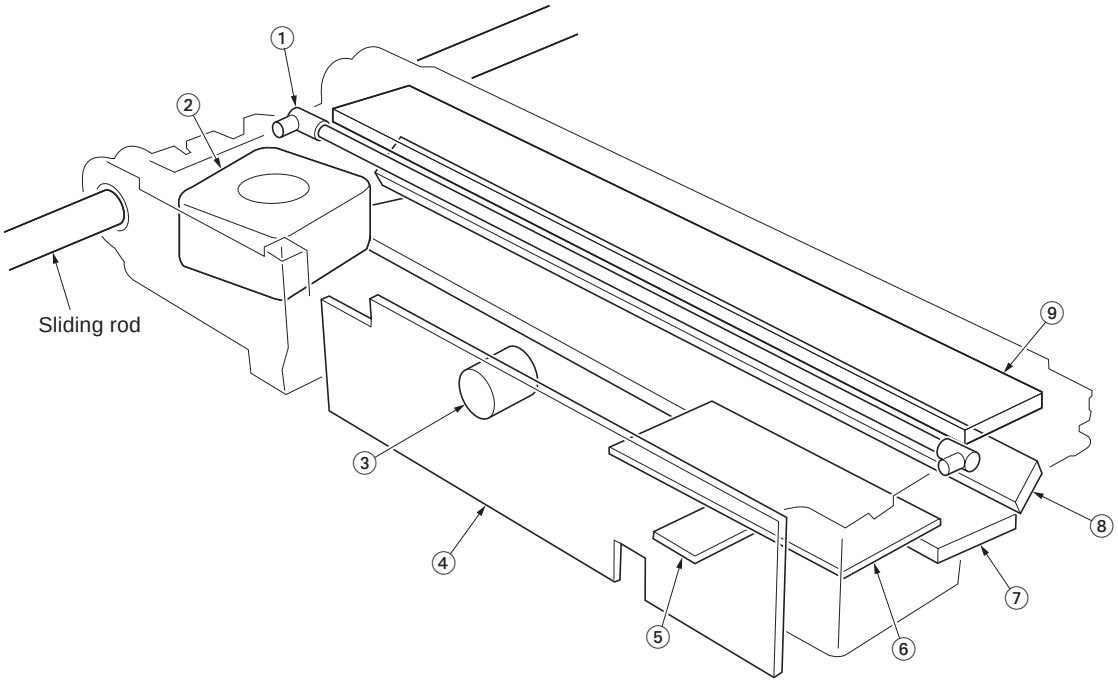

Figure 2-1-20Optical module unit

(1) Exposure lamp
(2) Scanner motor
(3) Lens
(4) CCD PWB
(5) Scanner home position sensor
(6) Inverter PWB
(7) Mirror
(8) Mirror
(9) Mirror

2-1-10 Document processor (DP) section

(1) Document processor (DP)

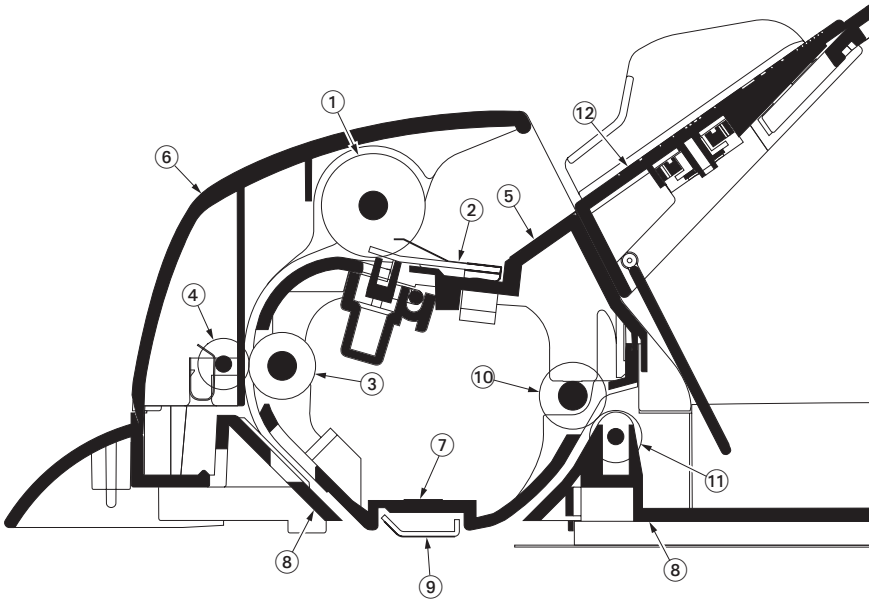

Figure 2-1-21Document processor (DP) section

(1) Original feed roller
(2) Pad assembly
(3) Original conveying roller
(4) Original conveying pulley
(5) DP upper housing
(6) DP cover
(7) DP bottom housing
(8) DP frame
(9) DP contact plate
(10) Original exit roller
(11) Original exit pulley
(12) Original table

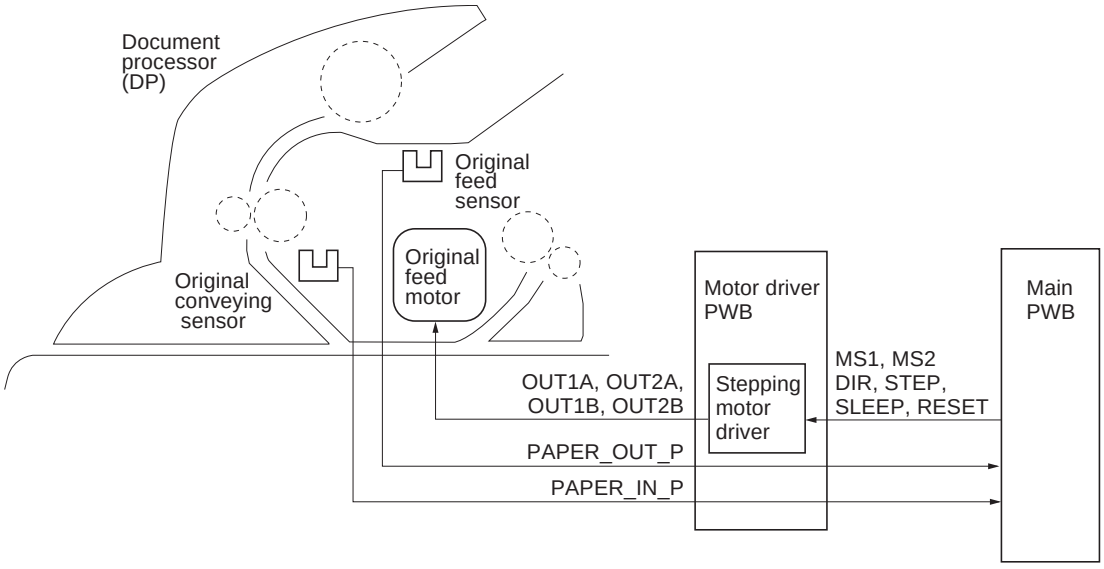

Figure 2-1-22Document processor (DP) section block diagram

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2-2-1 Electrical parts layout

(1) Electrical parts layout

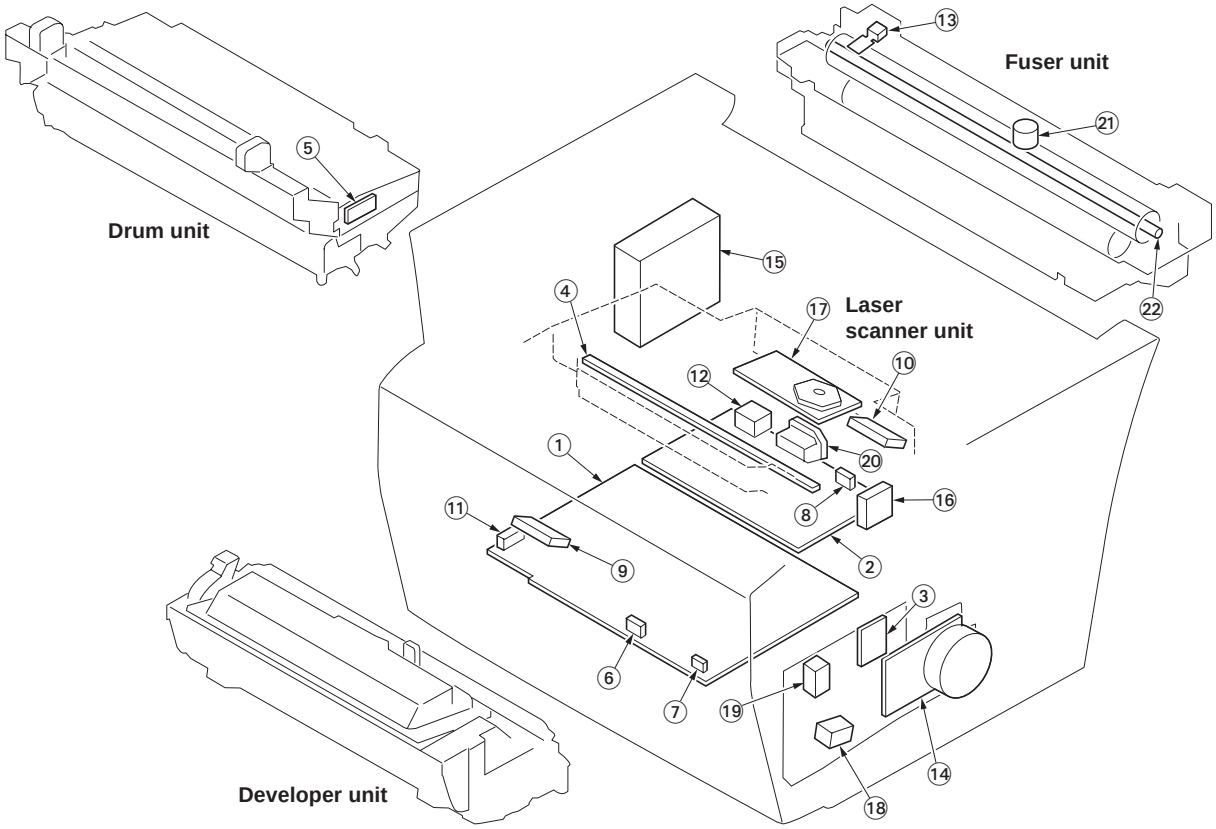


Figure 2-2-1 MFP main frame

1. Engine/high voltage PWB ..... Controls the input/output of electrical parts and generates the high voltage.
2. Power source PWB ..... After full-wave rectification of AC power source input, switching for converting to 24 V DC and 5 V DC for output.
3. Connect PWB ..... Consists the buzzer and wiring relay circuit.
4. Eraser lamp PWB ..... Eliminates the residual electrostatic charge on the drum.
5. Zener PWB ..... Adjusts the main charger grid electrostatic potential.
6. Registration sensor ..... Detects the timing of primary feeding and paper jam.
7. Paper sensor ..... Detects paper in the paper cassette.
8. Exit sensor ..... Detects paper jam in the fuser unit and paper exit section.
9. Toner empty sensor ..... Measures toner in the toner container.
10. Waste toner full sensor ..... Detects the waste toner reservoir (drum unit) being full.
11. Interlock switch ..... Monitors whether the top cover is open and cuts off the 24 V DC power-source.
12. Power switch ..... Turns ON/OFF the AC power source.
13. Fuser thermistor ..... Measures the heat roller temperature.
14. Main motor ..... Drives the entire machine.
15. Cooling fan motor ..... Cools the interior of machine.
16. Power source fan motor ..... Cools the power source PWB.
17. Polygon motor ..... Drives the polygon mirror.
18. Feed clutch ..... Controls the paper cassette paper feed.
19. Registration clutch ..... Controls the primary paper feed.
20. AC inlet ..... Connects the AC power source.
21. Thermal cutout ..... Shuts off the power source to the heater lamp when the heat roller reaches extremely high temperature.
22. Heater lamp ..... Energizes the heat roller.

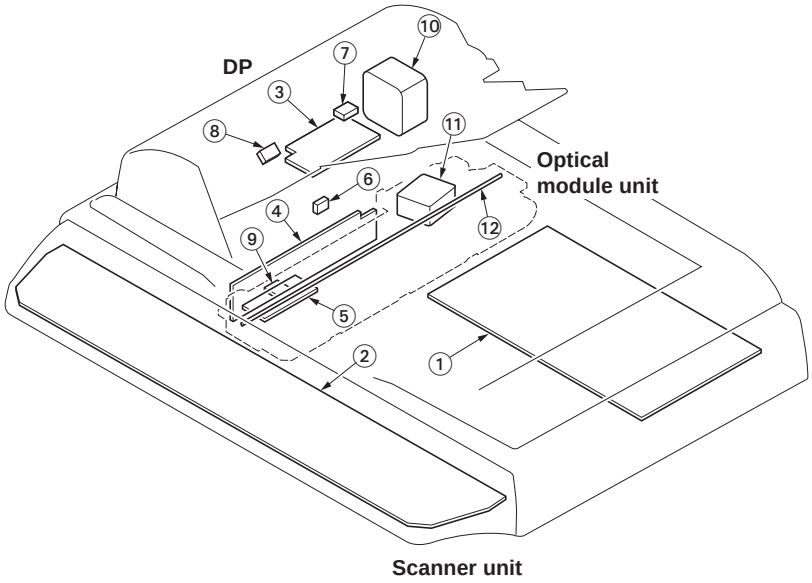


Figure 2-2-2 Scanner unit and document processor (DP)

1. Main PWB ..... Controls the software such as the print data processing and provides the interface with computer.
2. Operation panel PWB ..... Indicates the LED indicators and controls key inputs.
3. Motor driver PWB..... Controls the DP unit.
4. CCD PWB ..... Reads the image off originals.
5. Inverter PWB..... Controls the exposure lamp.
6. Scanner unit open/close switch ..... Detects when the scanner unit is opened or closed.
7. Document feed sensor..... Detects the presence of an original.
8. Document conveying sensor..... Detects the original scanning timing.
9. Scanner home position sensor ..... Detects the optical module unit in the home position.
10. Document feed motor ..... Drives the original feed section.
11. Scanner motor ..... Drives the optical module unit.
12. Exposure lamp ..... Exposes originals.

2-3-1 Power source PWB

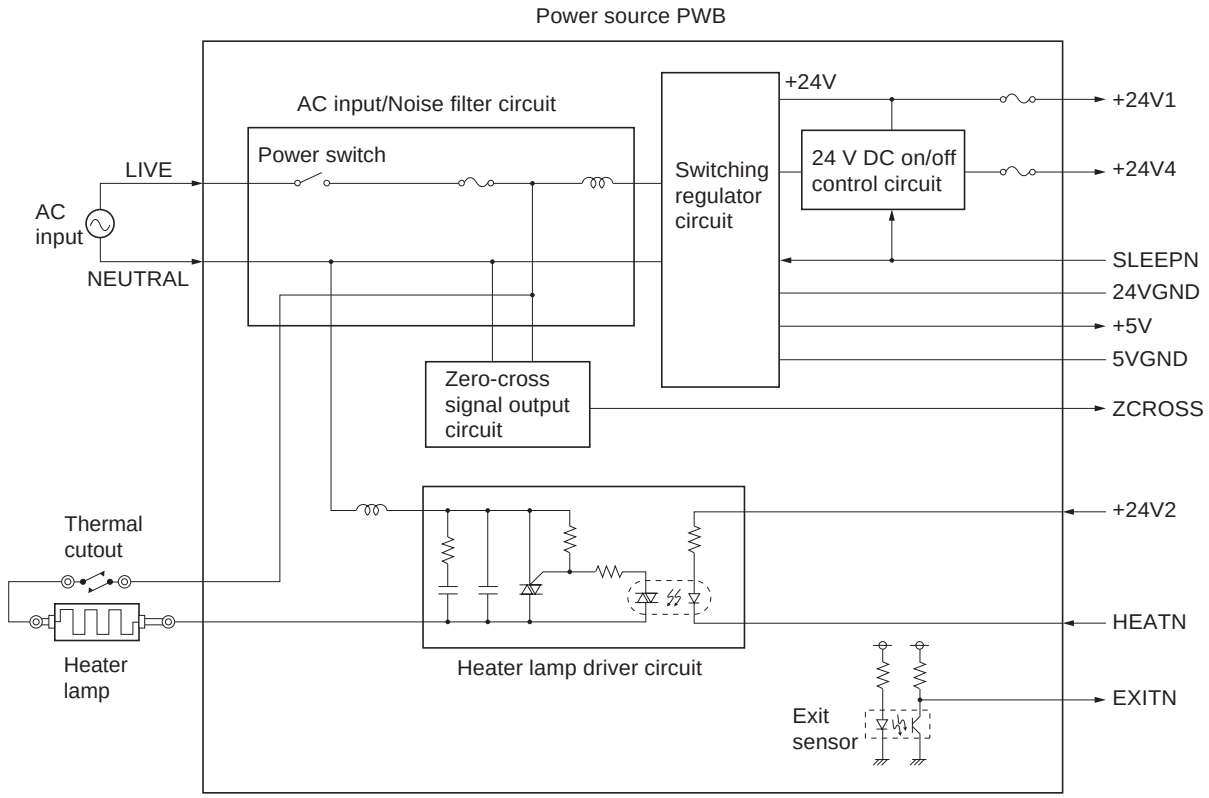


Figure 2-3-1Power source PWB block diagram

The power source PWB consists of the switching regulator section that is the main part, other zero-cross signal output circuit and heater lamp driver circuit. The switching regulator section consists of the AC input/Noise filter circuit, switching regulator circuit and 24 V DC on/off control circuit, At, and this circuit converts the AC power input to the 5 V DC and 24 V DC power source by the switching operation and outputs it to the engine/high voltage PWB. The zero-cross signal output circuit detects the 0 V point (zero cross) of the AC wave form and outputs to the engine/high voltage circuit, and the engine/ high voltage PWB outputs the heater lamp ON signal (HEATN) to the heater lamp driver circuit based on the timing of zero-cross signal (ZCROSS) and controls the AC power loading to the heater lamp.

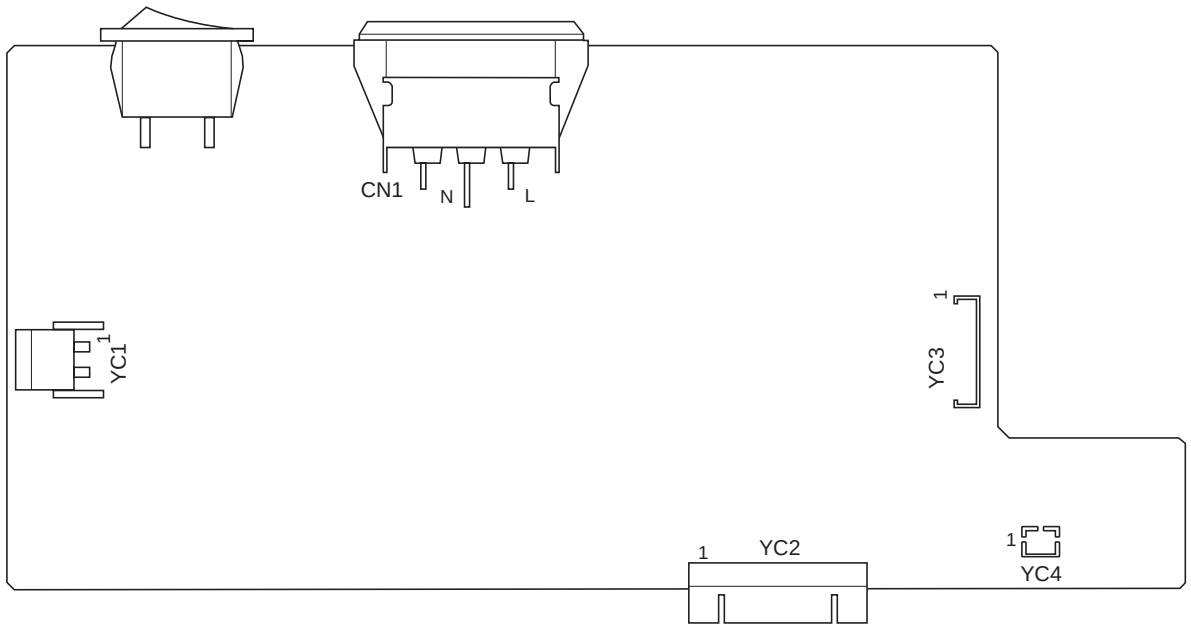


Figure 2-3-2Power source PCB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
CN1	1	LIVE	I	220 - 240 V AC 120 V AC	AC power input
Connected to the AC inlet	3	NEUTRAL	I	220 - 240 V AC 120 V AC	AC power input
YC1	1	HEATERLIVE	O	220 - 240 V AC 120 V AC	Power supply for heater lamp (On/Off)
Connected to the heater lamp	3	NEUTRAL	O	220 - 240 V AC 120 V AC	Power supply for heater lamp (On/Off)
YC2	1	+5V	O	5 V DC	5 V DC power output
Connected to the engine/high voltage PWB	2	+5V	O	5 V DC	5 V DC power output
	3	GND	-	-	Ground
	4	GND	-	-	Ground
	5	+24V2	I	24 V DC	24 V DC power input (via interlock switch)
	6	HEATN	I	0/24 V DC	Heater lamp: On/Off
	7	SLEEPN	I	0/5 V DC	Sleep mode: On/Off
	8	EXITIN	O	0/5 V DC	Exit sensor: On/Off
	9	ZCROSS	O	0/5 V DC (pulse)	Zero cross signal
	10	+24V	O	24 V DC	24 V DC power output
	11	+24V	O	24 V DC	24 V DC power output
	12	GND	-	-	Ground
	13	GND	-	-	Ground
YC3	1	+24V4	O	24 V DC	24 V DC power output
Connected to the main PWB	2	GND	-	-	Ground
	3	GND	-	-	Ground
	4	GND	-	-	Ground
	5	+5V	O	5 V DC	5 V DC power output
	6	+5V	O	5 V DC	5 V DC power output
YC4	1	+5V2	O	5 V DC	5 V DC power output
Connected to the power source fan motor	2	FAN	O	0/5 V DC	Power source fan motor: On/Off

2-3-2 Engine/high voltage PWB

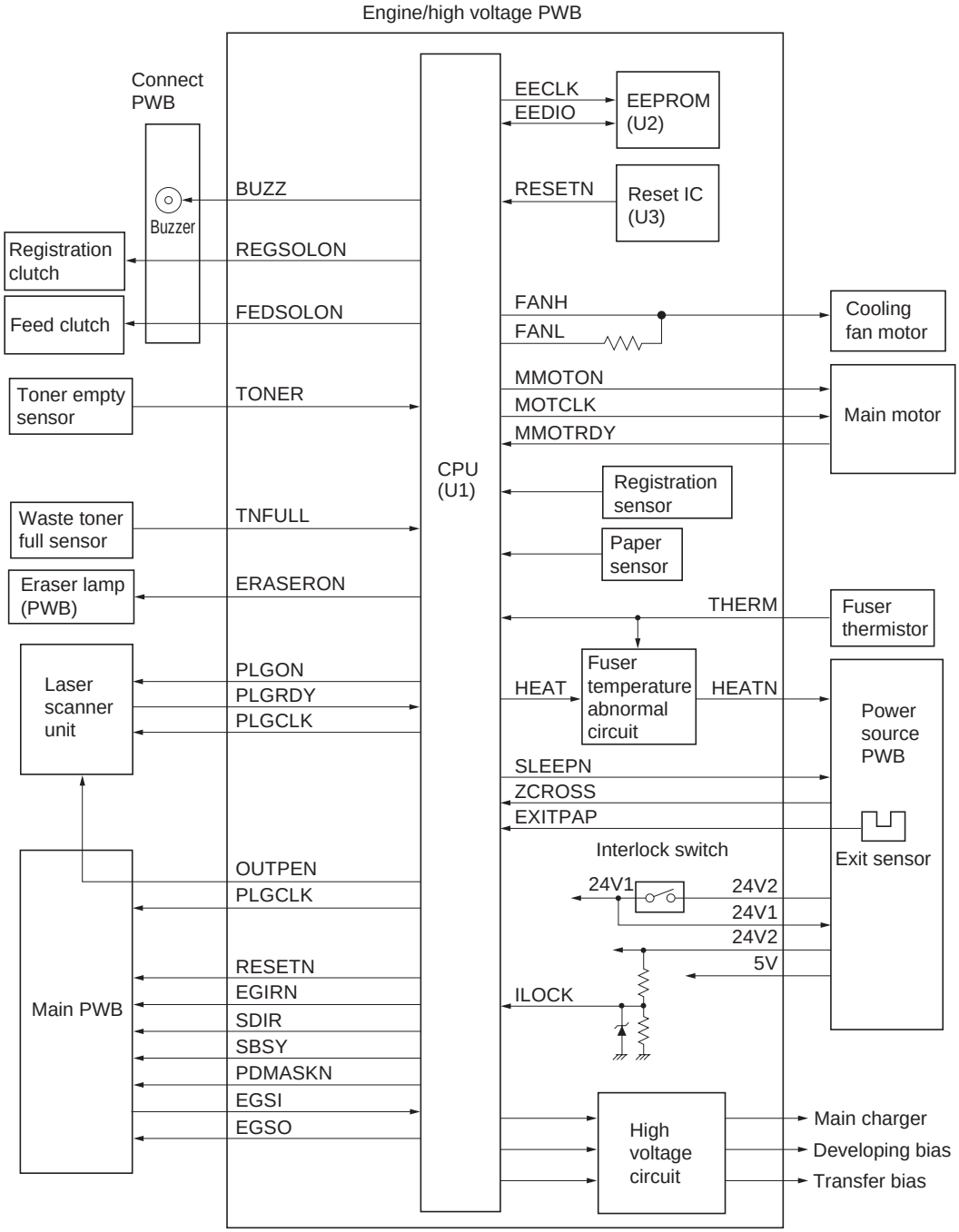


Figure 2-3-3Engine/high voltage PWB block diagram

The engine/high voltage PWB consists mainly of CPU (U1) and it is primarily divided into the engine circuit section that controls the entire hardware such as the process and paper feeding/conveying mechanism and the high voltage circuit section that generates various high voltages to output during the process operation.

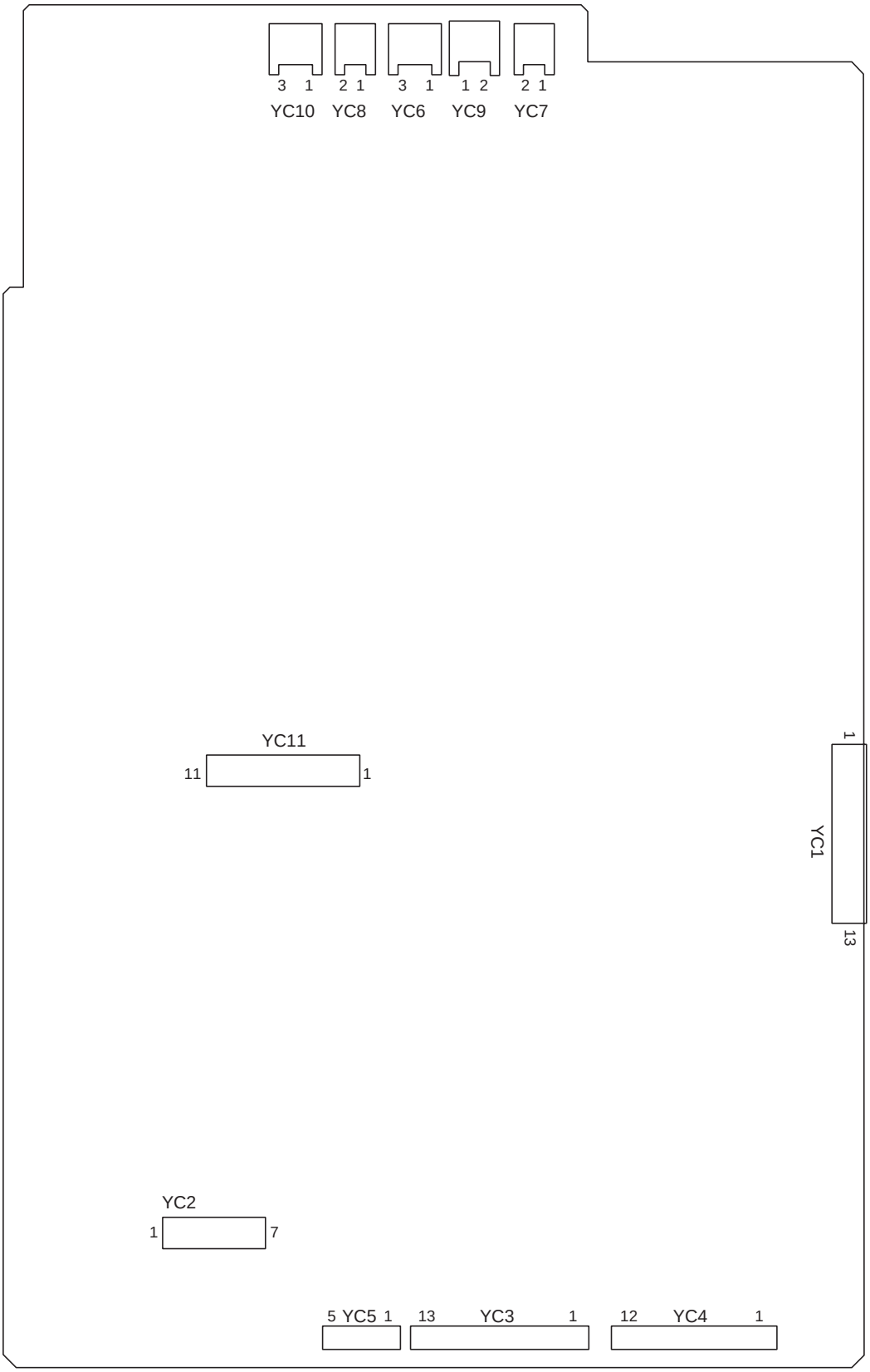


Figure 2-3-4Engine/high voltage PWB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
YC1	1	+5	I	5 V DC	5 V DC power input
Connected to the power source PWB	2	+5	I	5 V DC	5 V DC power input
	3	GND	-	-	Ground
	4	GND	-	-	Ground
	5	+24V	O	24 V DC	24 V DC power output (via interlock switch)
	6	HEATN	O	0/24 V DC	Heater lamp: On/Off
	7	SLEEP	O	0/5 V DC	Sleep mode: On/Off
	8	EXITIN	I	0/5 V DC	Exit sensor: On/Off
	9	ZCROSS	I	0/5 V DC (pulse)	Zero cross signal
	10	+24V	I	24 V DC	24 V DC power input
	11	+24V	I	24 V DC	24 V DC power input
	12	GND	-	-	Ground
	13	GND	-	-	Ground
YC3	1	PLGCLK	O	5 V DC (pulse)	Polygon motor clock signal
Connected to the laser scanner unit and connect PWB	2	PLGRDY	I	0/5 V DC	Polygon motor: Ready/Not ready
	3	GND	-	-	Ground
	4	GND	-	-	Ground
	5	+24V3	O	24 V DC	24 V DC power output
	6	+24V3	O	24 V DC	24 V DC power output
	7	REGSOLON	O	0/24 V DC	Registration clutch: On/Off
	8	FEDDOLON	O	0/24 V DC	Feed clutch: On/Off
	9	BUZ	O	0/5 V DC (pulse)	Buzzer: On (4 kHz)
	10	FPLED2	-	-	Not used
	11	FPLED1	-	-	Not used
	12	FPSW	-	-	Not used
	13	GND	-	-	Ground
YC4	1	RESETN	O	0/5 V DC	Reset signal
Connected to the main PWB	2	EGIRN	O	0/5 V DC	Engine interrupt signal
	3	SDIR	O	0/5 V DC	Communication direction change signal
	4	SBSY	O	0/5 V DC	Engine busy signal
	5	PDMASKN	O	0/5 V DC	PD mask control signal
	6	EGSI	I	0/5 V DC (pulse)	Engine interface serial communication data
	7	SCLKIN	I	0/5 V DC (pulse)	Clock signal for engine interface
	8	EGSO	O	0/5 V DC (pulse)	Engine interface serial communication data
	9	PLGCLK	I	0/5 V DC (pulse)	Clock signal for polygon motor
	10	OUTPEN	O	0/5 V DC	Laser output: On/Off
	11	-	-	-	-
	12	GND	-	-	Ground
YC5	1	+23V3	O	24 V DC	24 V DC power output
Connected to the main motor	2	GND	-	-	Ground
	3	MMOTRDY	-	-	Ground (power)
	4	MOTCLK	O	0/5 V DC (pulse)	Main motor clock signal
	5	REMOTE	O	0/5 V DC	Main motor: On/Off
YC6	1	+5V	O	5 V DC	5 V DC power output
Connected to the waste toner full sensor	2	TNFULL	I	0/5 V DC	Waste toner full sensor detecting signal: Full/Not full
	3	GND	-	-	Ground
YC7	1	+5V	O	5 V DC	5 V DC power output
Connected to the fuser thermistor	2	THERM	I	Analog	Fuser thermistor detection voltage

Connector	Pin No.	Signal	I/O	Voltage	Description
YC8	1	ERASPW	O	24 V DC	24 V DC power output
Connected to the eraser lamp (PWB)	2	ERASER	O	0/24 V DC	Eraser lamp (PWB): On/Off
YC9	1	+24V1	O	24 V DC	24 V DC power output
Connected to the cooling fan motor	2	FAN	O	0/12/24 V DC	Cooling fan motor: Full speed/Half speed/Off
YC10	1	+5V	O	5 V DC	5 V DC power output
Connected to the toner empty sensor	2	TONER	I	0/5 V DC	Toner empty/Not
	3	GND	-	-	Ground

2-3-3 Main PWB

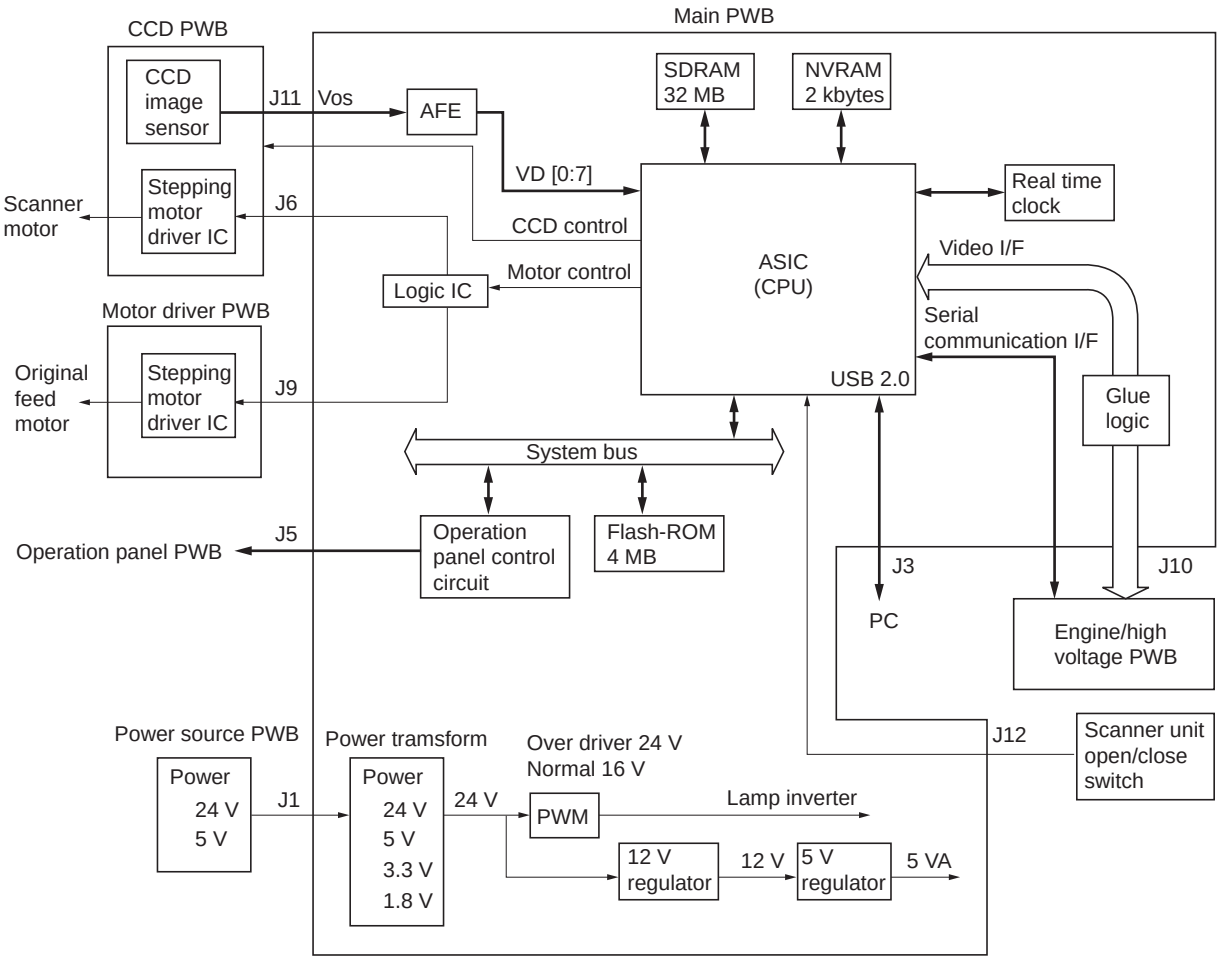


Figure 2-3-5Main PWB block diagram

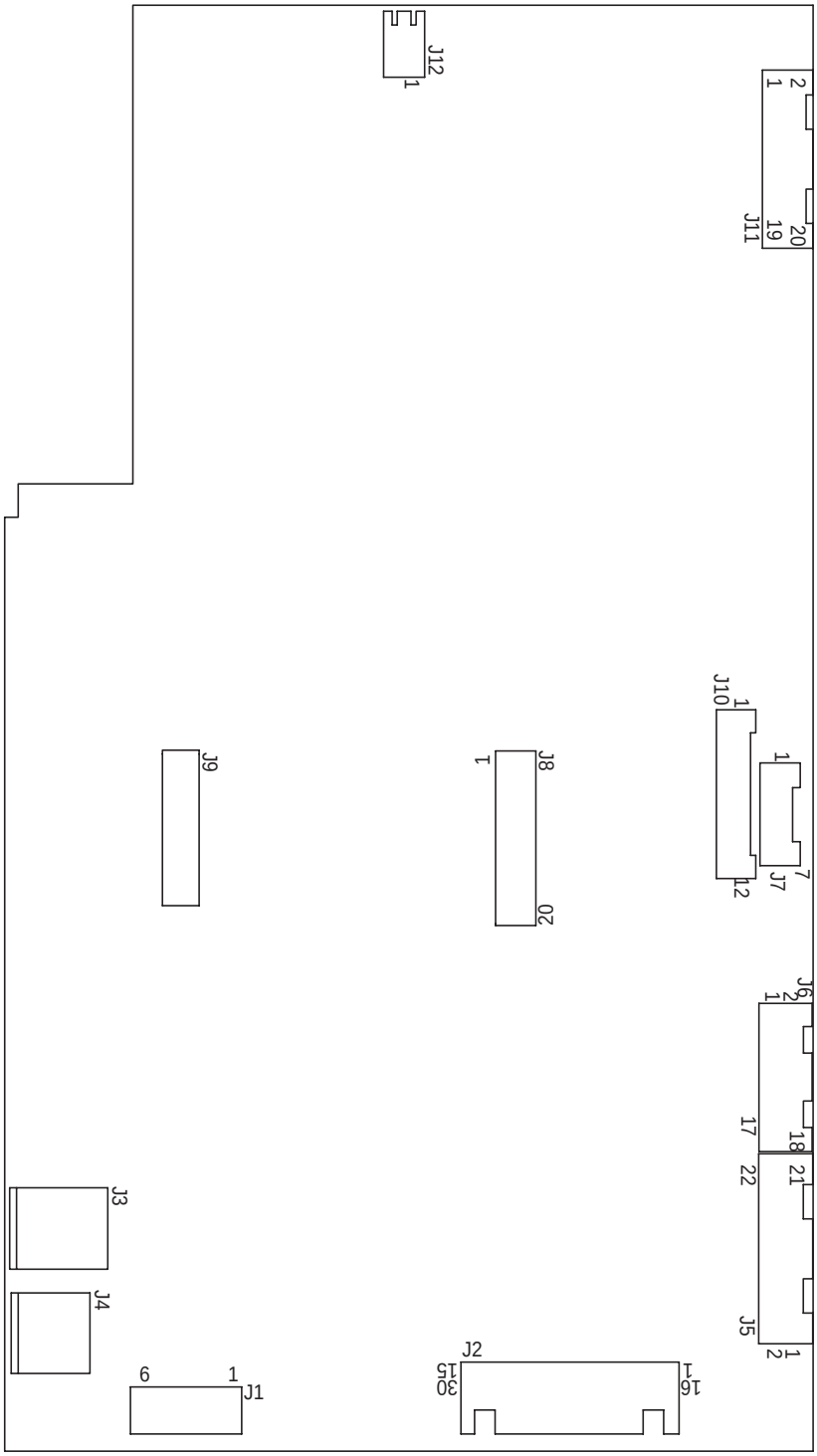
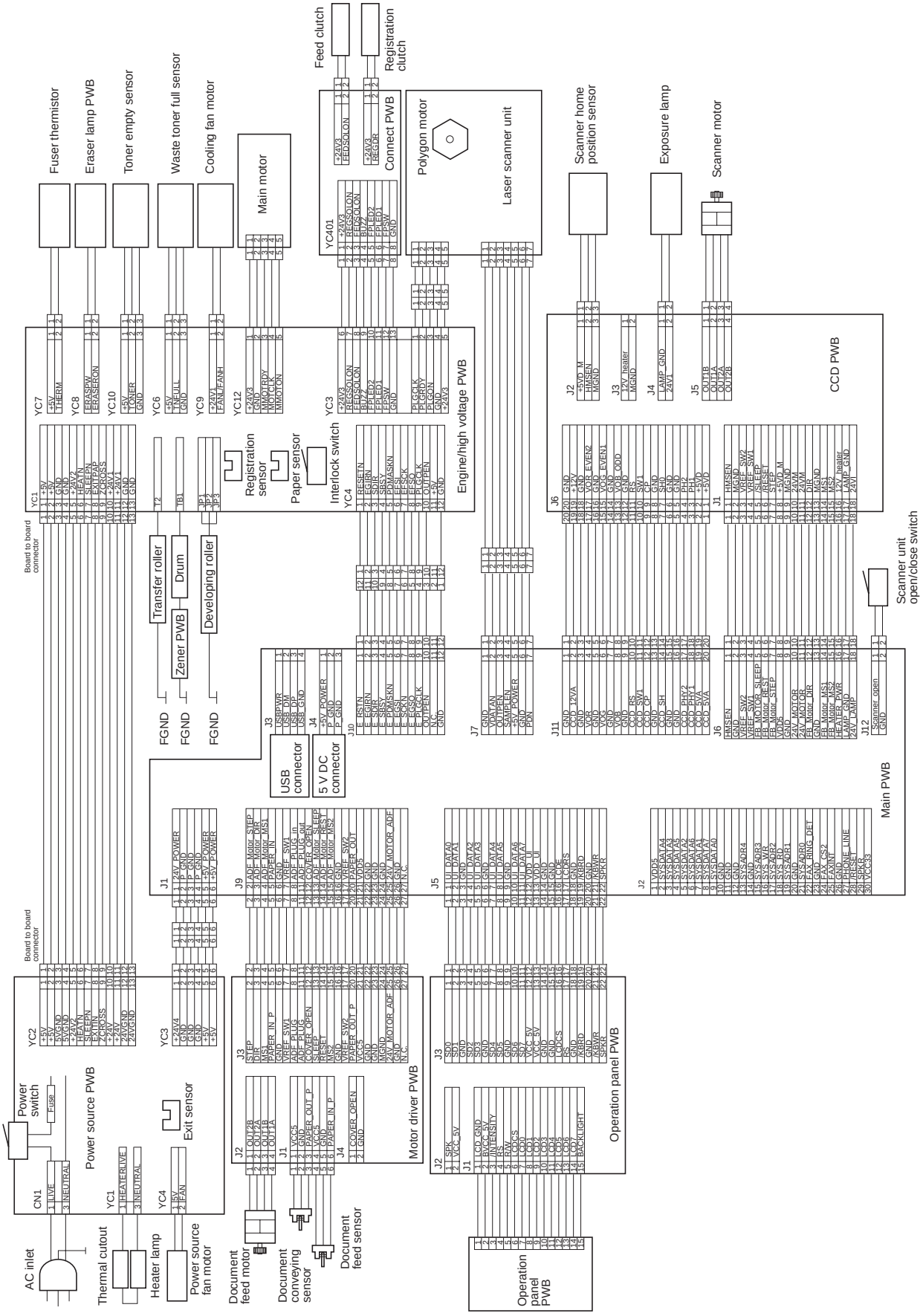
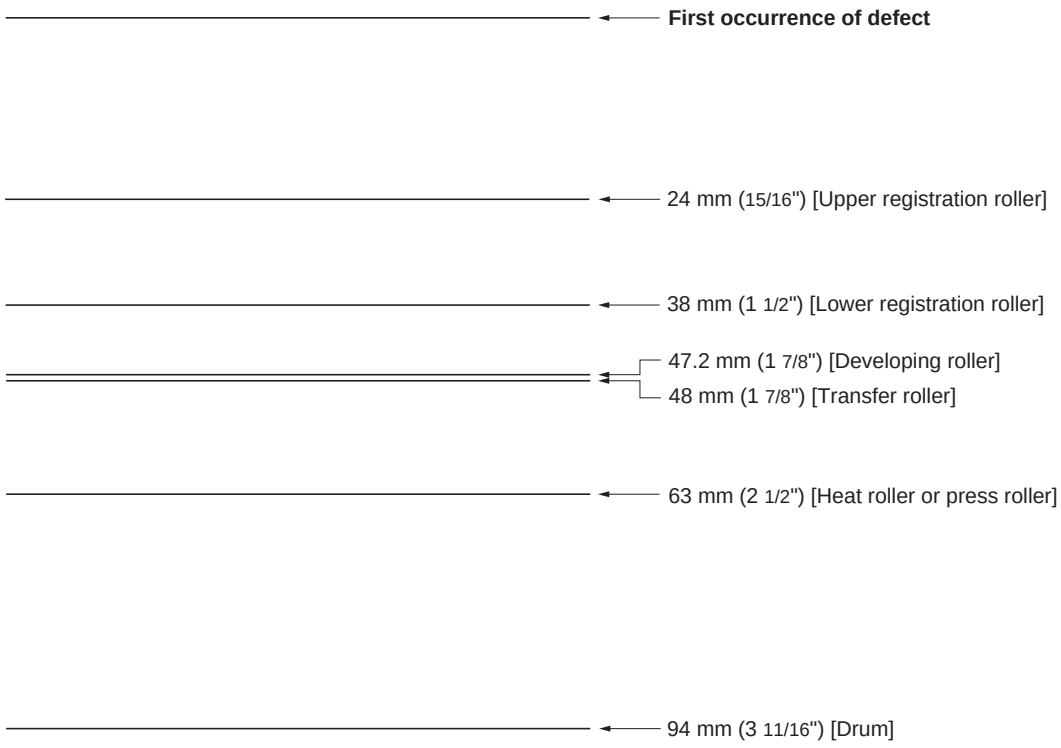


Figure 2-3-6Main PWB silk-screen diagram

(1) Wiring diagram



(2) Repetitive defects gauge


First occurrence of defect
24 mm (15/16") [Upper registration roller]
38 mm (1 1/2") [Lower registration roller]
47.2 mm (1 7/8") [Developing roller]
48 mm (1 7/8") [Transfer roller]
63 mm (2 1/2") [Heat roller or press roller]
94 mm (3 11/16") [Drum]